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Provisional small arms firing manual for the United States ...

United States. War Dept. General Staff

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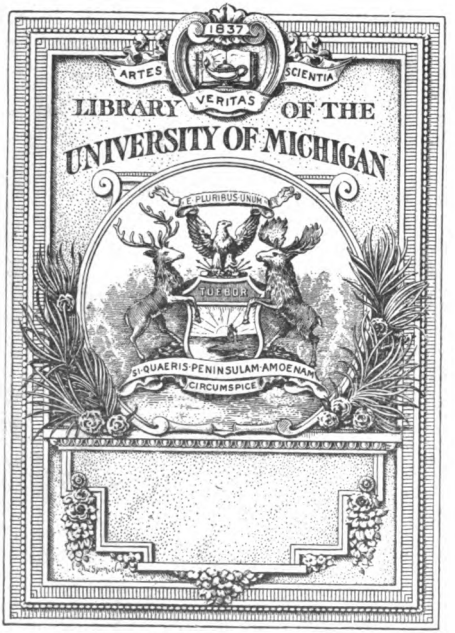

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Provisional Small Arms Firing Manual

For the United States Army

and

For the Organized Militia of the United States

1909

Washington : : Government Printing Office : : 1909

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WAR DEPARTMENT

DOCUMENT No. 338

OFFICE OF THE CHIEF OF STAFF

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WAR DEPARTMENT,
OFFICE OF THE CHIEF OF STAFF,
WASHINGTON, *January 23, 1909.*

The following "Provisional Small-Arms Firing Manual" is approved and herewith published for the information and guidance of the Regular Army and the Organized Militia of the United States. Its provisions will take effect January 1, 1910.

By order of the Secretary of War:

J. F. BELL,
Major-General, Chief of Staff.

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SMALL-ARMS FIRING MANUAL.

DEFINITIONS.

Aiming device:

A device to be attached to the rifle by which the instructor, standing on one side and facing the rear sight on the rifle, when the soldier is in the act of aiming, can see the reflection of both sights and the object aimed at, and can therefore judge of the accuracy of the soldier's aim and the steadiness of his trigger squeeze. (See page 26, Ordnance Publication 1923, "Description and rules for the management of the United States magazine rifle.")

Anemometer:

An instrument for measuring the velocity of the wind.

Battle sight:

The position of the rear sight in which the leaf is laid down. With the model 1903 rifle and sight, this position corresponds to a range of 530 yards. With the sight in this position, the flight of the bullet is at no point more than 2 feet above the line of sight, and the dangerous space is continuous for a target of that height above the line of sight.

Bore:

The cylindrical cavity in the small-arms barrel.

Bull's-eye:

The black circular division in the center of the bull's-eye target.

Butt:

The embankment or other means used to stop bullets in rear of the target. The plural "butts" is used to designate collectively the parapet, pit, and back stop of a group of targets.

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Caliber:
The interior diameter of the small-arms barrel, measured between the lands. The caliber of the United States magazine rifle is 0.30 inch; that of the pistol, 0.38 inch.

Cant:
To revolve the barrel of the piece on its axis to the right or left while aiming.

Center:
The annular division of the bull's-eye targets A, B, and C embraced between the bull's-eye and the circumference of the next larger circular division of the target. Shots in this space have a value of 4.

Classification:
The arranging of the individuals of an organization in groups or classes according to the degree of skill displayed in record practice on the range with the rifle or revolver.

Coach:
A special instructor charged with the duty of giving information to the firer.

Danger space:
The sum of the distances in the path of the bullet in which an object of given height will be struck. At long ranges the danger space at the further end of the range alone is considered.

Disappearing target:
A target which is temporarily exposed to view.

Disk, marking:
A staff with a disk at each end, used by the marker in the pit in signaling the results of hits on the target.

Distinguished marksman:
An officer or enlisted man who has won three of the authorized medals in department, departmental, division, and army rifle or carbine competitions, or as a member actually firing on a prize-winning team in the national team match.

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Distinguished revolver shot:
An officer or enlisted man who has won three of the authorized medals in department, departmental, division, and army revolver competitions.

Drift:
The lateral deviation of the bullet caused by the resistance of the air and the rotation of the bullet on its longer axis.

Echelon, order in:
In the order in echelon the targets or firing stands are placed one behind another to the right or left and unmasking one another.

Emplacement:
The space on the target range allotted for the position of the target.

Estimating distance:
Calculating approximately, by means of range-finding instruments, by sight or by sound, the distance of an object from the observer. Estimating distance is a factor in determining the qualification of the expert rifleman, sharpshooter, and marksman.

Expert rifleman:
See "Classification," par. 345.

Extreme range:
Distances beyond 1,200 yards.

Field practice:
The prescribed firing at targets simulating the appearance of an enemy under conditions approaching those found in war and the application of this class of fire to tactical exercises.

Fire at will:
That class of fire in which, within the restrictions of the command for firing, the individuals deliver their fire independently of the commander and of each other.

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Fire control:
Or conduct of fire, is the exercise by a commander, over his fire unit or units, of that power which enables him to regulate the fire in obedience to his will. It pertains especially to the technicalities immediately involved in delivery of fire.

Fire direction:
Or employment of fire, is a general term embracing the various steps, including tactical disposition, which enable the commander of one or more fire units to bring an effective fire to bear upon the desired target at the proper time. It pertains especially to preparation of fire.

Fire discipline:
Is that condition of the personnel of a fire unit, resulting from training and practice, which enables the commander to obtain an orderly and efficient delivery of fire.

Gallery practice:
Firing at reduced targets at short ranges with small caliber rifles.

Gallery, shooting:
A room or inclosure in which gallery practice can be conducted.

Grooves:
The spiral channels within the bore of the rifle barrel.

Individual practice:
The firing on the range by which the individual soldier receives his instruction and by which his classification is determined.

Inner:
The annular division of the bull's-eye targets A, B, and C outside the center. Shots in this space have a value of 3.

Insignia:
A badge or distinguishing mark issued for expertness with the rifle or revolver.

Instruction practice:
The prescribed firing on the range which precedes record practice and which is devoted to the instruction of the soldier.

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Lands:
Spaces in the bore of the rifle barrel between the grooves.

Long range:
From 800 to 1,200 yards.

Marksman:
See "Classification," par. 345.

Mid-range:
From 500 to 800 yards.

O'clock:
A term employed to indicate, by means of the divisions on the dial face of the clock, the location of a hit on the target or the direction from which the wind may be blowing, as a 7 o'clock, 4 or 5 o'clock, wind. In speaking of the position of a hit, the dial is supposed to occupy the front of the target facing the firer, with 12 at the top of the target. In speaking of wind, the dial is supposed to lie on the ground, with the 12 toward the target and the center at the firing point.

Outer:
The space on the bull's-eye targets A, B, and C outside the inner. Shots in this space have a value of 2.

Parapet:
An elevation of earth or other material thrown up in front of the targets to protect the markers.

Pit:
The space between the parapet and the butt or bullet stop occupied by the markers.

Practice season:
Those portions of the target year devoted to firing with the service cartridge. They include the regular season and the supplementary season.

Preliminary drills:
Consist of sighting drills, position and aiming drills, gallery practice, deflection and elevation correction drills, and estimating distance drills.

Preliminary practice:
The prescribed firing on the range which precedes the competitions.

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Proficiency test:
The annual test administered at each post, by the post commander or an experienced officer of suitable rank specially selected by the post commander, to determine the proficiency in rifle firing of the organizations serving thereat.

Prone:
Lying flat on the belly. The only position with the body extended on the ground authorized in known distance firing.

Protest:
A formal objection against some act or decision.

Qualification:
The grade attained in known distance practice depending upon the scores made by individuals in record practice.

Range:
Any tract of land over which firing with small arms is conducted. This term is also used to signify the distance of the objective from the firer.

Range officer:
A commissioned officer charged with the care, police, etc., of the targets and range at any post. For detail of range officer's duties see pars. 104, 193, and 287.

Rapid fire.
Rapid fire is that in which the time limit is thirty seconds or less for each score fired with the rifle and ten seconds or less for each score fired with the revolver at a disappearing target.

Record practice:
The prescribed firing on the range, following instruction practice, by which the classification of the soldier is determined.

Regular season:
Comprises three months, not necessarily consecutive, of the target year, selected by the department commander, in which the prescribed course of known distance and field firing is pursued.

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Ricochet shot:
One where the bullet strikes the ground or other object, and is thereby deflected from its original course. Hits on any target from ricochet shots have the same value as direct hits.

Score cards:
Pasteboard cards issued to competitors at the army and departmental competitions, giving the number of the target of each competitor firing, with his order of firing, and containing a blank space for the record of the shots fired and for the signature of the scorer.

Score:
Groups of five consecutive shots (exclusive of sighting shots) fired in individual practice. The term "score" is also used to express the result of any series of shots, as the result of a skirmish run.

Sharpshooter:
See "Classification," par. 345.

Short range:
0 to 500 yards.

Shot marks:
Disks of thin material, 3 inches, 5 inches, and 10 inches in diameter, respectively, with a wire spring of two branches secured to the disk near its center. They are white on one side and black on the other, and are used to mark on the bull's-eye target the position of the last shot.

Sighting shots:
The trial shots which must precede the soldier's first record score at the 500, 600, 800, and 1,000 yard ranges. They form no part of the score.

Skirmish fire:
Skirmish fire is that varied fire prescribed for the skirmish range at a disappearing target.

Skirmish run:
One advance of the skirmisher or squad on the skirmish targets.

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Slow fire:
Slow fire is that in which the time limit is not less than 30 seconds per score and not more than one minute per shot.

Special courses A, B, and C:
Special course "A" is a course of rifle practice provided for posts where a complete rifle range is not available, but where a range of 200 and 300 yards can be had. Special course "B" is a course for posts where no range can be obtained. Special course "C" is a course for the organized militia.

Spotter:
One who, in team practice, announces the value of shots and indicates on a wooden target by means of pins, the position of hits on the range target.

Supplementary season:
A period of the target year, selected by the post commander, as nearly midway between the regular annual seasons as practicable, in which all recruits who have joined too late to participate in the regular practice season will fire.

Target:
An object presenting a mark to be fired at. (See Part VI, Chap. I, for description of targets.)

Telescopic sight:
A telescope or other device attached to the barrel of the piece so as to enlarge the objective when aiming.

Timed fire:
Timed fire is that in which the time limit is between twenty and thirty seconds for each score at a bull's-eye target.

Trajectory:
The path described by the bullet moving under the influence of the projectile force, the force of gravity, and the resistance of the air.

Twist:
The spiral formed by the grooves in the barrel of a rifled piece. In the United States magazine rifle, model 1903, this twist is uniform, one turn in 10 inches. In the revolver it is one turn in 16 inches.

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PART I.

GENERAL SCHEME.

IMPORTANCE OF RIFLE FIRE.—In an engagement of all arms rifle fire must always be the most important factor, and by it will the results of battles be most frequently decided.

NUMBER OF HITS ALL-IMPORTANT.—As the effect of rifle fire depends upon the number of hits made, not upon the number of shots fired, it follows that troops untrained in fire discipline, fire direction, and fire control, and who can not hit what they shoot at, are of little value on the field of battle.

To send troops into battle without thorough preparatory training in the use of their arms is to expose them to death uselessly.

OBJECT OF INSTRUCTION.—The sole purpose of rifle training for the soldier is to make of him a good shot under war conditions, and a scheme of instruction will be effective in so far as it tends to produce that result. Such a scheme should be progressive in character, beginning with simple and easy exercises and advancing by stages to the more complex and difficult field firing exercises which represent as nearly as possible conditions which will confront the officer and soldier in action. The preliminary drills and the range practice, in sequence, are a preparation for field practice in which war conditions are simulated, and in each of these classes of instruction the idea of progression from the simple to the more difficult is kept in view.

The course herein prescribed has been arranged as follows:

1. Nomenclature of the rifle; care and preservation of the rifle.
2. Sighting drills.
3. Position and aiming drills.
4. Gallery practice.
5. Deflection and elevation correction drills.

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6. Estimating distance drill.
7. Individual known distance firing, instruction practice.
8. Individual known distance firing, record practice.
9. Field practice, individual and collective.
10. Company proficiency test.

The course of revolver firing includes the following:

1. Nomenclature of the revolver; care and preservation; general facts and principles.
2. Position and aiming drills, and rapid-fire drills; dismounted and mounted.
3. Practice with blank cartridges, mounted, on the track at targets.
4. Individual firing, instruction practice.
5. Individual firing, record practice.

PERIOD OF PRELIMINARY INSTRUCTION.—The portion of the year which immediately precedes the instruction of the soldier upon the target ground will be utilized by laying, by a thorough course of the preliminary drills and gallery practice, the only enduring foundation for future proficiency. This especially applies to recruits and those who in the last season failed to qualify. The instructors will also improve this opportunity for explaining the different theoretical principles, as far as the capacity and interest of the men appear to render it advantageous; and for conducting such exercises in estimating distances as may be prescribed. Recruits will also receive preliminary instruction during the month after joining their commands.

As the successful education of the soldier in rifle firing requires that the causes of his errors as well as their nature should be determined before they can be overcome, and as this can be done only under the most favorable conditions, department commanders should include in the regular practice season the months most favorable for this instruction.

INSPECTORS OF SMALL-ARMS PRACTICE.—In each department and division an inspector of small-arms practice, selected with reference to his special fitness and practical qualifications for supervising the course of instruction, will be appointed.

DUTIES OF POST COMMANDERS.—For the instruction of their commands, and for the degree of proficiency which they manifest, post commanders will be primarily responsible, and it is expected that they will exact from the troops under their command the highest degree of proficiency attainable. It will be

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their duty to direct and conduct the instruction of their officers in the general theoretical principles of the subject, and by frequent supervision of the preliminary drills and exercises, and of the practice of the companies, to assure themselves that the captains and their assistants are thoroughly conversant with all the details of the course; that they conduct the instruction of their men with energy and judgment, and where any deviations are made from the prescribed methods of instruction, that they are only those best adapted to secure the most favorable results.

DUTIES OF BATTALION COMMANDERS.—Battalion and squadron commanders will supervise the practice of their commands.

THEORETICAL INSTRUCTION OF NONCOMMISSIONED OFFICERS.—Company commanders will so conduct the theoretical instruction of their noncommissioned officers that they may be enabled to render intelligent assistance in the instruction of the company.

DUTIES OF COMPANY OFFICERS.—The education of the men in small-arms firing will be under the immediate supervision of the company commander, assisted by his lieutenants, noncommissioned officers, and expert shots. The different steps in the general system of preliminary drills and instruction will be kept in view, but the details of the various methods may be modified by the company commander if the particular circumstances of any special case appear to render a change advisable.

PARTICIPATION OF COMPANY OFFICERS.—As progress in rifle and revolver firing depends not only upon the method of instruction, but to a great degree upon the capabilities of the instructors, it is essential that the company officers should themselves become proficient, not only in the theoretical but in the practical details of the subject. They will participate in the preliminary drills and exercises and in the other parts of the course; they will always attend target practice, firing with the men (subject to the provisions of paragraph 87) and endeavoring to excel the company in proficiency with the rifle or revolver.

PROFICIENCY OF A COMPANY.—If the preliminary drills and the higher principles of target firing are thoroughly taught, every soldier, unless he is subject to some physical defect, can by careful practice become so proficient in the use of his weapon as to make his fire effective.

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To attain this result a most earnest and energetic effort on the part of officers will be required. They should endeavor to awaken the enthusiasm of their men and to foster the spirit of emulation; they should take all possible pains to avoid discouraging the poorer shots, reminding them that while at first they may seem to make but slight progress, yet that careful attention to the instruction and advice that they receive will ultimately be amply rewarded.

The course of target practice herein prescribed has been arranged with a view to obtaining the maximum of efficiency in field practice, which is the nearest approach to firing under actual war conditions that can be obtained in time of peace, and in the instruction imparted on the range this end must be kept in view.

The proficiency test for organizations will be prescribed annually, as hereafter provided.

DISCRETION ALLOWED INSTRUCTORS.—While in the following pages the methods of instruction are often described in considerable detail, it is not intended that they should be necessarily implicitly followed. In many cases the company commander, directly present with his men and noticing from day to day their peculiarities, can substitute other methods of instruction with advantage; but as this manual offers a guide which if faithfully adhered to will usually produce in any body of men a number of good shots, and will so educate a company that the effect of their fire at the different distances met with in action will be greatly increased, it is recommended that they be departed from only after due consideration.

FIELD PRACTICE.—The practice on the range, having been conducted at known distances, at targets which are selected for their visibility, it then becomes necessary to extend this training so as to properly fit troops to make the best use of the rifle in war. Instruction and practice in the estimation of distances must therefore be carried further than the few exercises and tests laid down to qualify in known distance firing. Troops must be practiced in locating and picking up an indistinct target such as would in all probability be offered them under the conditions of actual war; in quickly estimating range to such an objective, opening fire upon it, and making the best use of the ground. Company officers and higher commanders will be ex-

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ercised in the enforcement of fire discipline, and in fire control, fire direction, and use of ground. The officers and men should be impressed with the fact that target practice and instruction is not for the sole purpose of making good shots on the range, but the making of good shots on the battle field, and special attention should be devoted to cultivating in troops, by suitable exercises, those habits which are essential to success in any battle, but the greatest protection lies in the ability of the soldier to overcome the fire of his adversary with his own. What should be striven for are units composed of men so trained as to be able to take full advantage of the ground and their weapons in action.

The trial of new kinds of targets, of new methods of firing, and the working out of new problems in field firing will be encouraged.

UNIFORMITY TO BE PREFERRED.—The object of target practice should be to produce uniformity rather than develop expertness in particular men. A man who has been a good shot seldom, if ever, loses his ability to shoot well. The attention of the instructor should, therefore, be concentrated on the poorer shots rather than on the best shots.

ECONOMY OF AMMUNITION.—The course of known distance practice admits of saving ammunition on the best shots and using the extra ammunition in the instruction of the poorer shots.

RECORD COURSE.—Record course is prescribed for the purpose of classifying enlisted men with a view of awarding insignia and the increased pay for excellence in marksmanship.

SUPPLEMENTARY PRACTICE SEASON.—A supplementary course of instruction is prescribed for the benefit of recruits. This supplementary practice is for the purpose of preventing an accumulation, for an extended period, of recruits totally uninstructed in target firing. It takes place, as nearly as practicable, midway between two regular seasons.

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PART II.

PRELIMINARY INSTRUCTION AND DRILLS FOR RIFLE.

1. Although each recruit is required to be instructed in the nomenclature, care, use, and preservation of the rifle, and the necessary precautions against accidents, this instruction will be repeated as the initial step for each season's known distance practice for all who have not qualified as "marksman" or better in the preceding season. Special effort will be made to eradicate harmful or dangerous practices.

The sighting drills, position and aiming drills, and gallery practice will be given to all soldiers; the amount to be given men who have qualified as marksman or better is left to the discretion of the company commander. Estimating distance drill is required to be given to all soldiers.

By means of these drills many soldiers can be taught how to shoot without ever having fired a shot. These methods, then, are of supreme importance in time of war, when great numbers of volunteers must be instructed and ammunition for target practice is scarce.

CHAPTER I.

SIGHTING DRILLS.

2. PURPOSE:

(*a*) To show how to align the sights properly upon the mark.

(*b*) To discover and demonstrate errors in sighting.

(*c*) To teach uniformity in sighting.

(*d*) To select for each individual the sight with which he gets the best results.

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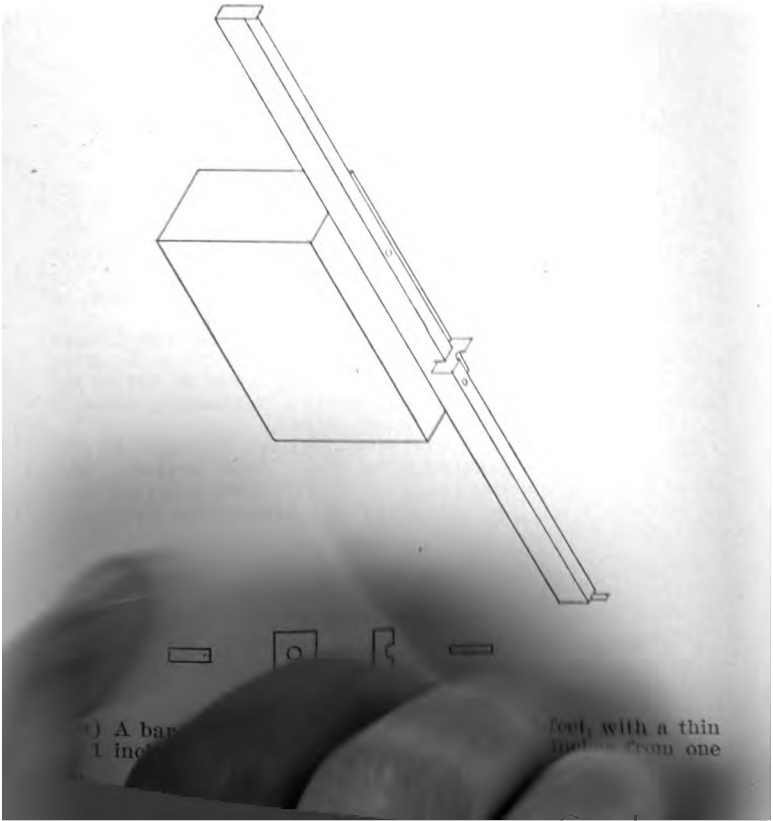
3. APPARATUS AND ITS USE—SIGHTING BAR.—(See Plate I.) To consist of:



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(*b*) A front sight of tin or cardboard ½ by 3 inches tacked to the end nearest slot and projecting 1 inch above bar.

(*c*) An eyepiece of tin or cardboard 1 by 3 inches tacked to the other end of and projecting 1 inch above the bar, with a very small hole (0.03 inch) ½ inch from top of part projecting above bar.

(*d*) An open rear sight of tin or cardboard 1½ by 3 inches, with a U-shaped notch ¾ inch wide cut in the middle of one of the long edges. This is placed in the slot on the bar. A slight bend of the part of the tin fitting in the slot will give enough friction to hold the sight in any part of slot in which it is placed.

(*e*) A peep rear sight of tin or cardboard 3 by 3 inches, with a peephole ¾ inch in diameter cut in the center. This replaces the open sight when the peep sight is shown.

Carefully blacken all pieces of tin or cardboard and the top of the bar. Nail the bar to a box about 1 foot high and place on the ground, table, or other suitable place. Then adjust the open or peep rear sight in the slot and direct the bar upon a bull's-eye (preferably a Y target) placed about 5 yards from the bar. No other than the sight desired can be seen. Kinds of sights, errors, etc., are shown by manipulating the open and peep rear sights.

4. Sighting Rest for Rifle.—(See Plate 2.) Take an empty revolver-ammunition box or a similar well-made box, remove the top and cut notches in the ends to closely fit the rifle. Place the rifle in these notches with the trigger-guard close to and outside one end. Nail a plank (top of box will do) to a stake or wall about 12 inches from the ground. Fasten a blank sheet of paper to the plank. Place the rest firmly on the ground, 20 or 30 feet from the plank, so that the rifle is canted neither to the right nor left—weight the box with sand if necessary—and without touching the rifle or rest sight the rifle near the center of the blank sheet of paper. Changes in the line of sight are made by changing the elevation and windage. Take the prone position with elbows on the ground, hands supporting the head, and the eye the same distance from the rear sight as in shooting. A soldier acting as marker is provided with a pencil and a small rod bearing a disk of white cardboard about 3 inches in diameter, with a black bull's-eye (a black paster is

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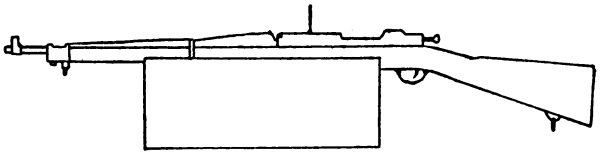
best) pierced in the center with a hole just large enough to admit the point of a lead pencil. The soldier sighting directs the marker to move the disk to the right, left, higher or lower, until the line of aim is established, when he commands "Mark"



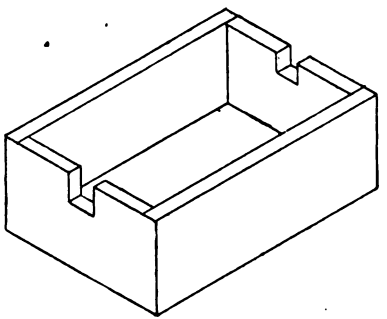


PLATE II.

or "Hold.' At the command "Mark," being careful not to move the disk, the marker records through the hole in its center the position of the disk and then withdraws it. At the command "Hold," the marker holds the disk carefully in place without

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marking until the position is verified by the instructor, and the disk is not withdrawn until so directed.

5. LINE OF SIGHT AND LINE OF AIM.—The line of sight is determined by a point on the middle line of the notch of the open rear sight, or the center of the peep, and the top of the front sight.

The line of aim is determined by a point on the middle line of the notch of the rear sight, or the center of the peep, and a point immediately below the mark and separated from it by a line of light. When looking along the line of aim the top of the front sight is brought into this line, it is said to be "on the mark." If the sights are properly set, the mark will then be struck. The instructor will show the men the center of the peep, the middle line of the rear notch, the top of the front sight, and the point immediately below the bull's-eye. The soldier will be informed that to give the greatest uniformity the point just below the mark, and not the mark, is taken as the point of aim, as it is impossible to always know, if touching the mark with the top of the front sight, how much of the front sight is seen; that the term "on the mark or bull's-eye" will be understood to mean an aim taken just below the mark showing a well-defined line between the mark and the top of the front sight.

6. KINDS OF SIGHTS; FINE SIGHT.—(See Fig. 1, Plate 3.) Look through the rear-sight notch at the bull's-eye and bring the front sight into the line of aim so that only the tip of the front sight is seen above the bottom of the rear-sight notch. This will give a fine sight.

HALF SIGHT.—(See Fig. 2, Plate 3.) Continue to raise the front sight until the top of it is in line with the top of, and in the center of the rear-sight notch, and aligned upon the point just below the bull's-eye. This will give a half sight.

FULL SIGHT.—(See Fig. 1, Plate 4.) Continue to raise the front sight until all of the front sight down to the movable stud is seen, the top aligned upon the point just below the bull's-eye. This will give a full sight.

PEEP SIGHT.—(See Fig. 2, Plate 4.) Look through the peephole at the bull's-eye and bring the front sight up until the top of the front sight is in the center of the peephole and aligned

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upon the point just below the bull's-eye. This will give a peep sight. Some riflemen prefer to place the bull's-eye in the center

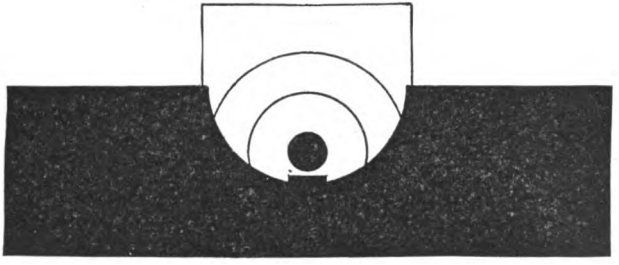

FIG. 1.

FIG. 2.
PLATE III.

of the peephole, and bring the top of the front sight up to the point just below the bull's-eye—a method more or less restricted

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FIG. 1.

FIG 2

PLATE IV.

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to symmetrical objects, like the bull's-eye, as a mark in aiming.

REMARKS.—Regular results in firing, for a particular individual, can be obtained only when the same amount of front sight is taken each time, and this necessitates the selection of the kind of sight best suited for this purpose.

The eye can be focused accurately upon objects at but one distance at a time; all other objects in the field of view will appear more or less blurred, depending on their distance from the eye. This can be readily seen if a pencil is placed in the field of view near the eye, while looking at some distant object. The pencil will appear blurred. This is the condition met with by the normal eye in sighting a rifle. If the eye is focused on one of the three points—the bull's-eye, the front sight, or the rear sight—the other two will appear blurred. This blurring effect is best overcome by using the peep sight as though looking through a window and focusing the eye on the bull's-eye. The blurring of the peephole will be concentric, giving a clear and easily defined center. The blurring of the front sight will be less, but symmetrical on both sides with very little blur on the top. It can be readily and naturally brought to the center of the peephole. Variations in light also have the least effect on the peep sight.

But the limited field of view and lack of readiness in getting a quick aim with the peep sight necessitate for many men the use of the open sight—especially for rapid fire, skirmishing, and field practice. In this case the half sight should be habitually used, as the horizontal line at the top of the notch of the rear sight affords a good guide for regularity, the blurring effect is partly overcome as in the peep sight, and there is more light than with the fine sight. With the fine sight, the amount of front sight, apparently the same to the eye, varies with the amount of light. With the full sight, there is no guide for regularity.

The effect of the full sight is to cause a higher point of the object aimed at to be struck than if either of the other kinds of sight had been taken. The fine sight will cause a lower point to be struck.

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FIRST SIGHTING EXERCISE.

7. Using illustrations, describe the different kinds of sights.

8. Using the sighting bar, represent the different kinds of sights and require each man in the squad to look at them.

9. Using the sighting bar, describe and represent the usual errors of sighting and require each man in the squad to look at them.

SECOND SIGHTING EXERCISE.

10. Using the sighting rest for the rifle, require each man to direct the marker to move the disk until the rifle is directed on the bull's-eye with a half sight and command "Hold." The instructor will verify this line of sight. Errors, if any, will be explained to the soldier and another trial made. If he is still unable to sight correctly the first exercise will be repeated.

Soldiers will sometimes be found who do not know how to place the eye in the line of sight; they often look over or along one side of the notch of the rear sight and believe that they are aiming through the notch because they see it at the same time that they do the front sight. This error will probably be made evident by the preceding exercise. Some men in sighting will look at the front sight and not at the object. As this often occasions a blur, which prevents the object from being distinctly seen and increases both the difficulties and inaccuracies of sighting, it should be corrected.

11. Repeat the above, using the peep sight.

THIRD SIGHTING EXERCISE.

12. When using the sighting rest for the rifle require each man to direct the marker to move the disk until the rifle is directed on the bull's-eye with a half sight and command "Mark"; then, being careful not to move the rifle or sights, repeat the operation until three marks have been made.

(*a*) THE TRIANGLE OF SIGHTING.—Join the three points determined as above by straight lines, mark with the soldier's name, and call his attention to the triangle thus formed. The

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shape and size of this triangle will indicate the nature of the variations made in aiming.

(*b*) ABNORMAL SHAPE, CAUSES.—If the triangle is obtuse-angled, with its sides approaching the vertical (see fig. 1, pl. 5), the soldier has not taken a uniform amount of front sight. If the sides of the triangle are more nearly horizontal (see fig. 2, pl. 5), the errors were probably caused by not looking through the middle of the notch or not over the top of the front sight. If any one of the sides of the triangle is longer than one-half inch the instructor directs the exercise to be repeated, verifying each sight and calling the soldier's attention to his errors. The instructor will explain that the sighting gains in regularity as the triangle becomes smaller.

(*c*) VERIFYING THE TRIANGLE.—If the sides of the triangle are so small as to indicate regularity in sighting, the instructor will mark the center of the triangle and then place the center of the bull's-eye on this mark. The instructor will then examine the position of the bull's-eye with reference to the line of sight. If the bull's-eye is properly placed with reference to the line of sight, the soldier aims correctly and with uniformity. If not so placed, he aims in a regular manner, but with a constant error.

(*d*) CAUSES OF ERRORS.—If the bull's-eye is directly above its proper position, the soldier has taken, in aiming, too little front sight; or if directly below, too much front sight. If directly to the right or left, the soldier has not sighted through the center of the rear sight notch and over the top of the front sight. If to the right, he has probably either sighted along the left of the rear sight notch, or the right side of the front sight, or has committed both of these errors. If the bull's-eye is too far to the left, he has probably sighted along the right of the rear sight notch, or the left of the front sight, or has committed both of these errors.

If the bull's-eye is placed with reference to its proper position diagonally above and to the right, the soldier has probably combined the errors which placed it too high and too far to the right. Any other diagonal position would be produced by a similar combination of vertical and horizontal errors.

As the errors thus shown are committed when the rifle is fixed in position, while that of the bull's-eye or target is altered,

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FIG. 1.

FIG. 2.

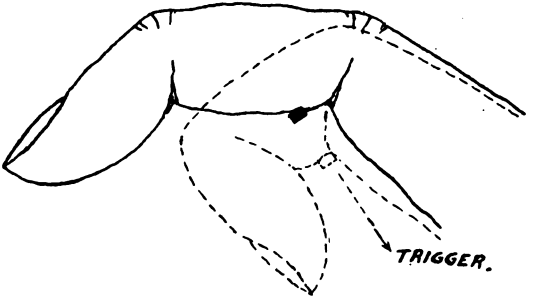

FIG. 3.

PLATE V.

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their effect will be directly opposite to the changes in the location of a hit in actual fire, occasioned by the same errors, when the target would be fixed and the rifle moved in aiming.

After the above instruction has been given to one man, the line of sight will be slightly changed by changing the elevation and windage, and the exercises similarly repeated with the others in the squad.

13. Repeat the third sighting exercise, using the peep sight.

FOURTH SIGHTING EXERCISE.

14. This exercise is a demonstration of the effect of canting the piece. The soldier must be impressed with the necessity of not canting the piece to the right or left when aiming, but of keeping the sights vertical. The tendency to cant the piece is natural to recruits and is frequently increased when the sling is used as an aid in holding the rifle. Explain to the soldier that if the piece is canted to the right, the bullet will strike to the right and below the point aimed at, even though the gun be otherwise correctly aimed and the sights correctly set. Similarly if the piece is canted to the left, the bullet will strike to the left and low. This can be explained by showing that the elevation fixes the height of the point where the bullet will hit the target, and that the windage fixes the point to the right or left, i. e., the elevation gives vertical effects and the windage horizontal effects. Let a pencil (or rod) held vertical, represent the elevation; now if the pencil is turned to the right 90°, or horizontal, all of the elevation has been taken off, causing the shot to strike low, and changed into windage, causing the shot to strike to the right.

15. This effect may be practically demonstrated as follows: Use the sighting rest with the rifle firmly held in the notches, the bolt removed. Paste a black paster near the center of the bottom line of the target. Sight the rifle on this mark, using about 2,000 yards elevation, then being careful not to move the rifle, look through the bore and direct the marker to move the disk until the bull's-eye is in the center of the field of view and command "Mark." Next turn the rest with the rifle on its side (say right), and with the same elevation sight on the same paster as above, then, being careful not to move the rifle, look through the bore and direct the marker to again move the disk

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until the bull's-eye is in the center of the field of view and command "Mark."

Not considering the fall of the bullet, the first mark represents the point struck with the sight vertical, the second mark represents the point struck, low and to the right, using the same elevation and the same point of aim, when the piece is canted 90° to the right.

Different degrees of canting the piece can be represented by drawing an arc of a circle through the two marks with the paster as a center. The second mark will be at a point on this arc corresponding to the degree of canting the piece. Emphasis will be laid upon the fact that this effect of canting increases with the distance from the target.

16. OTHER EXERCISES.—Time permitting, the instructor can devise other exercises which suggest themselves as useful and beneficial to his men. The following are examples:

(*a*) In strong sunlight make a triangle of sighting, using a rifle having sights worn bright. Then being careful not to move the rifle, blacken the sights and make another triangle. Use dotted lines for the triangle made with bright sights and full lines for the triangle made with blackened sights. The position and size of the two triangles will plainly show the advantages of the blackened sights.

(*b*) In strong sunlight make a triangle of sighting, then, being careful not to move the rifle, make another triangle, having first shaded the target and the man sighting.

The relative position of the triangles will show the importance of knowing the effects of varying degrees of light.

17. SELECTION OF SIGHT.—After the men have been thoroughly drilled in these exercises, the instructor should be able to select for each man the sight giving the best results, pending further experience on the range. A man using the peep sight should also be instructed with the open sight.

18. BATTLE SIGHT.—While the battle sight represents an elevation of 530 yards on the leaf, it will be found in practice that each gun must be sighted separately, so as to get the elevation on the leaf corresponding to that of the battle sight. This can be done by using the sighting rest and establishing the battle sight on the bull's-eye, then being careful not to move the rifle, raise the leaf and set the slide to the same line of sight. The elevation can then be read from the leaf.

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CHAPTER II.

POSITION AND AIMING DRILLS.

19. PURPOSE.—These drills are intended to so educate the muscles of the arm and body that the piece, during the act of aiming, shall be held without restraint, and during the operation of firing shall not be deflected from the target by any convulsive or improper movement of the trigger finger, or of the body, arms, or hands. They also establish between the hand and eye such a prompt and intimate connection as will insure that the finger shall act upon the trigger, giving the final pressure at the exact moment when the top of the front sight is seen to be directed upon the mark.

The fact, though simple, can not be too strongly impressed upon the recruit, that if at the moment the cartridge is discharged, the piece is properly supported and correctly aimed the mark will surely be hit. Then, since almost any intelligent man can be taught to aim correctly and to hold the sights aligned upon the mark with a fair amount of steadiness, it follows that bad shooting must necessarily arise from causes other than bad aiming. Of these causes the principal one is known to be the deflection given to the rifle at the moment of pulling the trigger, due to the fact that the soldier, at the moment of firing, instead of squeezing the trigger, jerks it. This convulsive action is largely due to lack of familiarity with the methods of firing, and to a subsequent constrained position of the muscles of the body, arms, and hands, which constrained position it is the purpose of the position and aiming drills to eradicate.

To become a good shot, constant, careful, and patient practice is required. Systematic aiming and squeezing the trigger can do much to make a rifleman. The men will be taught to take advantage of every opportunity for practicing, aiming, and squeezing the trigger. For this purpose the barracks and grounds in the vicinity of the barracks should be furnished with aiming targets, which the men will be encouraged to use at odd moments, as when waiting for a formation or during a rest. At drill the soldier will be cautioned never to squeeze the trigger without selecting an object and taking careful aim.

Care should be taken by the instructor not to make the position and aiming drills tedious or objectionable. If possible,

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from five to ten minutes every day should be spent in this practice, and particularly should this be done during and just preceding the practice season. When on the range waiting for his turn to fire, a soldier should use part of his time in position and aiming exercises, aiming at the targets or at objects outside of the range, and he should be made to understand that this practice previous to firing will tend to prevent nervousness and will have a marked effect upon his score.

20. DRILLS; GENERAL INSTRUCTIONS.—These drills are divided into four progressive exercises. The first exercise teaches the position; the second exercise teaches the position and the aim; the third exercise teaches the aim, and the manner of squeezing the trigger, and the fourth exercise teaches the methods of rapid fire. The exercises at first should be taught by the numbers; when more fully understood, without numbers.

To correct any tendency to cant the piece, the rear sight will be raised. A black paster at which to aim will be placed on the wall opposite each man. The squad being formed in single rank, with an interval of 1 yard between files, the instructor directs the men to take the position of "Ready," except that the position of the feet will be such as to insure the greatest firmness and steadiness of the body. The instructor then cautions "Position and aiming drill."

The exercise which is being taught should be frequently repeated and made continuous, the instructor prefacing the preparatory command by "Continue the motion" or "At will" and giving the command "Halt" at the conclusion of the exercise, when the soldier will return to the position of "Ready" as above. Or the soldier may be made to repeat the first and second motions by the command "One," "Two," the exercise concluding at the command "Halt."

POSITION EXERCISE.

21. The instructor commands: 1. *Position.* 2. EXERCISE.

At the last command, without moving the body, head, or eyes, raise the rifle smartly to the front of the right shoulder to the full extent of the left arm; elbow inclined downward; the barrel nearly horizontal; muzzle slightly depressed, heel of the butt on a line with the top of the shoulder.

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(Two.) Bring the piece smartly against the hollow of the shoulder, without permitting the shoulder to give way, press the rifle against it, mainly with the right hand, only slightly with the left; the forefinger of the right hand resting lightly against the trigger; the rifle inclined neither to the right nor left. At the same time bring the left elbow well under the rifle, the right elbow slightly advanced and raised to the height of the shoulder; the head erect; eyes to the front and not looking through the sights.

(Three.) Resume the position of "Ready."

22. REMARKS.—The instructor should especially notice the position of each soldier in this exercise, endeavoring to give to each man an easy and natural position. He should see that the men avoid drawing in the stomach, raising the breast, or bending the small of the back.

The butt of the piece must be pressed firmly, but not too tightly, into the hollow of the shoulder, and not against the muscles of the upper arm. If too tightly held, the pulsations of the body will be communicated to the piece; if too loosely, the recoil will bruise the shoulder. The entire surface of the butt should rest against the shoulder. If only the heel or toe touches it the recoil may throw the muzzle down or up, affecting the position of the hit. While both arms are used to press the piece to the shoulder, the left arm should be used to direct the piece and the right forefinger must be left free to squeeze the trigger.

AIMING EXERCISE.

23. The instructor will first direct the sights to be adjusted for the lowest elevation, and subsequently for the different longer ranges.

The instructor commands: 1. *Aiming.* 2. EXERCISE.

At the last command, execute the first and second motion of the position exercise.

(Two) Bend the head a little to the right; the cheek resting against the stock; the left eye closed; the right eye looking through the notch of the rear sight at a point slightly below the mark. (Three) Draw a moderately long breath, hold the breath, and slowly raise the rifle with the left hand, being careful not to incline the sight to either side until the line of sight is directly on the mark; hold the rifle steadily directed on the

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mark for a moment, then, without command and just before the power to hold the rifle steadily is lost, drop the rifle to the position of "Ready" and resume the breathing.

24. REMARKS.—Some riflemen prefer to extend the left arm. Such a position gives greater control over the rifle when firing in a strong wind or at moving objects. It also possesses advantages when a rapid as well as accurate delivery of fire is desired, but in firing in double rank the normal position, body rest, should be used, as it gives greater security to the left arm of the front-rank man.

The eye may be brought to the line of sight either by lowering the head or by raising the shoulder; it is best to combine somewhat these methods; the shoulder to be well raised by raising the right elbow and holding it well to the front and at right angles to the body.

If the shoulder is not raised it will be necessary for the soldier to lower the head to the front in order to bring the eye into the line of sight. Lowering the head too far to the front brings it near the right hand which grasps the stock. When the gun is discharged this hand is carried by the recoil to the rear, and when the head is in this position, may strike against the nose or mouth. This often happens in practice, and as a result of this blow often repeated, many men become gun shy, or flinch, or close their eyes at the moment of discharge. Much bad shooting ascribed to other causes is really due to this fault. Raising the right elbow at right angles to the body elevates the right shoulder, and this lifts the piece so that it is no longer necessary to incline the head materially to the front in order to look along the sights.

The length of the soldier's neck determining greatly the exact method of taking the proper position, the instructor will be careful to see that the position is taken without constraint.

25. As changes in the elevation of the rear sight will necessitate a corresponding change in the position of the soldier's head when aiming, the exercise should not be held with the sight adjusted for the longer ranges until the men have been practiced with the sights as they would generally be employed for off-hand firing.

26. The soldier must be cautioned that while raising the line of sight to the mark he must fix his eye on the mark and not on

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the front sight; the latter can then be readily brought into the line joining the rear-sight notch and mark. If this plan be not followed, when firing is held on the range at long distances, the mark will generally appear blurred and indistinct. The front sight will always be plainly seen, even though the eye is not directed particularly upon it.

27. The rifle must be raised slowly, without jerk, and its motion stopped gradually. In retaining it directed at the mark care must be taken not to continue the aim after steadiness is lost; this period will probably be found to be short at first, but will quickly lengthen with practice. No effort should be made to prolong it beyond the time that breathing can easily be restrained. Each soldier will determine for himself the proper time for discontinuing the aim.

28. The men must be cautioned not to draw and retain too long a breath, as a trembling of the body, would, in many cases, result.

29. Some riflemen prefer, in aiming, to keep both eyes open, but unless the habit is fixed, the soldier should be instructed to close the left eye.

TRIGGER-SQUEEZE EXERCISE.

30. The instructor commands: 1. *Trigger-squeeze.* 2. EXERCISE.

At the command EXERCISE, the soldier will execute the first motion of the aiming exercise. At the command (Two) the second motion of the aiming exercise.

(Three.) Draw a moderately long breath, hold the breath and slowly raise the rifle with the left hand, being careful not to incline the sights to either side, until the line of sight is on the mark; contract the trigger finger gradually, slowly and steadily increasing the pressure on the trigger while the aim is being perfected; continue the gradual increase of pressure so that when the aim has become exact the additional pressure required to release the point of the sear can be given almost insensibly and without causing any deflection of the rifle. Continue the aim a moment after the release of the firing pin, observe if any change has been made in the direction of the line of sight, and then resume the position of "Ready," cocking the piece by raising and lowering the bolt handle.

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31. REMARKS.—Poor shooting is too frequently the result of lack of proper coordination of holding the breath, the maximum steadiness of aim, and the squeeze of the trigger. By frequent practice in this exercise, each man should know the exact instant his firing pin will be released, and he must be taught to hold the breath, bring the sights to bear upon the mark, and squeeze the trigger all at the same time.

32. TRIGGER SQUEEZE.—The trigger should be squeezed, not pulled, the hand being closed upon itself, as a lemon is squeezed, the forefinger sharing in this movement. (See fig. 3, plate 5.)

If the trigger has been pulled with a jerk instead of being squeezed, the muzzle of the rifle will probably be diverted to the right or possibly downward at the moment of firing; it is with the object of discovering this error, if made, that the aim is continued after the firing pin has been released and the exact point noticed where the rifle is then directed. If at some point other than the mark, every effort should be made by the soldier, during subsequent practice at this exercise, to avoid pulling the trigger with a jerk.

33. ACQUAINTANCE WITH TRIGGER SQUEEZE.—The value of this exercise lies largely in that by means of it the soldier becomes familiar with the trigger squeeze of his rifle. Knowing this, he is able at any time to judge, within limits, what additional pressure is required for its discharge. By constant repetition of this exercise he should be able finally to squeeze the trigger to a certain point, beyond which the slightest movement will release the sear. Having squeezed the trigger to this point, the aim is corrected and, when true, the additional pressure is applied and the discharge follows.

RAPID-FIRE EXERCISE.

34. The instructor commands: 1. *Rapid-fire exercise.* 2. COMMENCE FIRING. At the first command the first and second motions of the trigger-squeeze exercise are performed. At the second command the soldier performs the third motion of the trigger-squeeze exercise, squeezing the trigger without disturbing the aim or the position of the piece, but at the same time without undue deliberation. He then, without removing the rifle from the shoulder, holding the piece in position with the

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left hand, grasps the handle of the bolt with the right hand, rapidly draws back the bolt, closes the chamber, aims, and again squeezes the trigger. This movement is repeated until the trigger has been squeezed five times, when, without command, the piece is brought back to the position of "ready."

35. PURPOSE.—The object of this exercise is to teach the soldier to shoot quickly and at the same time accurately. Good target shots are not infrequently poor game shots. On the battlefield, as well as on the hunting field, the target is constantly changing, and opportunities to fire with effect are fleeting. It follows that the ability to quickly catch the aim, to squeeze the trigger promptly, without disturbing the aim, and to get in, in quick succession, several well-directed shots on a vanishing target, is of great value to the soldier.

36. METHODS.—The methods of taking position, of aiming, and of squeezing the trigger, taught in the preceding exercises, should be carried out in the rapid-fire exercise, with due attention to all the details taught therein; the details being carried out as prescribed, except that greater promptness is necessary. In order that any tendency on the part of the recruit to slight the movements of aiming and of trigger squeeze shall be avoided, the rapid-fire exercise will not be taught until the recruit is thoroughly drilled and familiar with the preceding exercises. The recruit will be instructed that with practice in this class of fire the trigger can be squeezed promptly without deranging the piece.

37. REPETITION.—If the recruit seems to execute the exercise hurriedly or carelessly, the instructor will require him to repeat it at a slower rate.

38. MANIPULATION OF THE BREECH MECHANISM.—To hold the piece to the shoulder, and at the same time manipulate the breech mechanism with the proper facility, is only learned after much practice. Some riflemen, especially men who shoot from the left shoulder, find it easier, in rapid firing, to drop the piece to the position of load after each shot. While at first trial this method may seem easier, it is believed that, with practice, the advantage of the former method will be apparent, especially for younger men. After facility has been acquired in this exercise, it will be repeated with dummy cartridges.

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POSITION AND AIMING DRILL, KNEELING.

39. These exercises will be repeated in the kneeling position by causing the squad to kneel by the commands prescribed in the "Drill Regulations." The exercise will be executed as prescribed for standing, except that at the command "Two" in the position exercise the soldier will rest the left elbow on the left knee, the point of the elbow in front of the kneecap. The pasters for the kneeling exercise should be at 2½ feet from the floor or ground.

40. REMARKS.—Frequent rests will be given during practice in these exercises kneeling, as the position, if long continued, becomes constrained and unnecessarily fatigues the soldier.

In raising the rifle to the mark in the second and third exercises, the position of the left hand should not be changed, but the left forearm should be brought toward the body and at the same time the body bent slightly to the rear.

When aiming kneeling there is, from the nature of the position, a tendency to press the butt of the rifle against the upper arm instead of against the hollow of the shoulder; this will necessitate inclining the head considerably to the right to get the line of sight, and by bringing the rifle so far to the rear will, if the thumb is placed across the stock, cause it to give by the recoil a blow upon the nose or mouth.

These difficulties can be avoided by advancing the right elbow well to the front, at the same time raising it so that the arm is about parallel with the ground. The hollow of the shoulder will then be the natural place for the rifle butt, and the right thumb will be brought too far from the face to strike it in the recoil.

Some riflemen prefer, by bending the ankle, to rest the instep flat on the ground, the weight of the body coming more on the under part of the heel; this obviates any tendency of the right knee to slip; or, by resting the right side of the foot on the ground, toe pointing to the front, to bring the weight of the body on the left side of the foot. These positions are authorized.

41. CHOICE OF POSITION.—In firing kneeling, the steadiness obtained depends greatly upon the position adopted. The peculiarities of conformation of the individual soldier exert, when firing kneeling, a greater influence than when firing either

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standing, sitting, or lying down; the instructor should therefore carefully endeavor, noticing the build of each soldier, to place him in the position for which he is best adapted and which will exert the least tension or strain upon the muscles and nerves. It should be remembered, however, that without the rest of the left elbow on the knee this position possesses no advantage of steadiness over the standing position.

42. KNEELING POSITION; WHEN TAKEN.—The kneeling position can be taken more quickly than either the sitting or the prone position. It is, therefore, the position naturally assumed when a soldier, who is standing or advancing, has to make a quick shot at a moving or disappearing object and desires more steadiness than can be obtained standing.

POSITION AND AIMING DRILL, SITTING DOWN.

43. In many cases the men, while able to kneel and hold the piece moderately steady, can yet in a sitting position obtain much better results. All should, therefore, be instructed in aiming sitting down as well as kneeling.

To practice the soldier in the preceding exercises in a sitting position, the squad being formed in single rank, with an interval of one pace between files, the rifle should first be brought to an "Order arms;" the instructor then commands: "SIT DOWN."

At this command, make a half face to the right and, assisted by the left hand on the ground, sit down, facing slightly to the right, the left leg directed to the front, right leg inclined toward the right, both heels, but not necessarily the bottom of the feet, on the ground, the right knee slightly higher than the left; body erect, and carried naturally upon the hips; at the same time drop the muzzle of the piece to the front, and to the position of the first motion of load, right hand upon the thigh, just in front of the body, the left hand slightly above, but not resting upon the left leg.

The exercises will be executed as heretofore prescribed, except that at the command "Two (position exercise)" the soldier will rest the left elbow on the left knee, the point of the elbow in front of the kneecap, and the right elbow against the left or inside of the right knee, at the same time inclining the body from the hips slightly forward.

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For the aiming and trigger-squeeze exercises the pasters will be 2½ feet from the floor or ground.

On the completion of the exercises the instructor will command: "Rise," when the men rise, face to the front, and resume the "Order arms."

44. REMARKS.—If the preceding position is carefully practiced, steadiness is quickly attained. The right leg should not be carried so far to the right as not to afford a good support or brace for the right elbow.

This position can be modified, but, in general, not without impairing the steadiness of the man, by crossing the legs at the ankle, the outside of each foot resting upon the ground, body more erect, and the knees slightly more raised than in the previous position.

POSITION AND AIMING DRILL, LYING DOWN.

45. From the nature of the position, it is not practicable to execute the preceding exercises according to the method followed when standing or kneeling; instruction will, however, always be given with reference to the position, to the manner of assuming it, and to aiming and squeezing the trigger.

For this purpose the squad being formed as specified in paragraph 20 (and the black pasters there mentioned being about 12 inches from the floor) the squad will be brought to an "Order arms."

Then, being at an order, either standing or kneeling, the instructor commands: LIE DOWN, which will be executed as prescribed in the "Drill Regulations;" the legs may be spread apart and the toes turned out if found to give a steadier position.

Having taken the position as prescribed in the preceding paragraph, the legs should be inclined well to the left, and either crossed or separated as the soldier prefers or his particular conformation appears to render most desirable, and the body at the same time inclined very slightly to the right.

If care is exercised, a position of steadiness and ease can then, with practice, be quickly assumed.

Being at a "Ready," the instructor then commands: 1. *Trigger squeeze.* 2. EXERCISE.

At the latter command carry the left elbow to the front and slightly to the right; the left hand under the barrel at the bal-

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ance; weight of the body mainly supported by the left elbow, the right resting lightly on the floor or ground.

(Two.) Slide the rifle with the right hand through the left hand to the front, until the left hand is a little in front of the trigger guard; at the same time raise the rifle with both hands and press it against the hollow of the shoulder.

(Three.) Direct the rifle upon the mark, and carry out the further details of aiming and squeezing the trigger as prescribed in paragraph 30.

Then resume the position, lying down.

As soon as the men have acquired with accuracy the details of the position, they will be practiced, without the numbers, aiming and squeezing the trigger at will; but care will be taken not to unduly prolong the exercise.

To afford the men rest, or on completion of the exercise, the instructor will command: RISE, which is executed as prescribed in the "Drill Regulations."

46. REMARKS.—The preceding position for firing lying down possesses, in a greater degree than other positions, the merit of adaptability to changes in the configuration of the ground; it enables the soldier to deliver fire over low breastworks or improvised shelters and rests, and affords him a good view over the ground which separates him from his mark, and a large arc of fire, without altering the position of the body. Back positions are not authorized, except in field firing at extreme ranges.

In the lying position, when aiming, the left elbow should be under or slightly to the right of the barrel, the other elbow somewhat to the right, but not so far as to induce any tendency to slip on the floor or ground; the head elevated, the right shoulder well raised, and the rifle pressed firmly against it with both hands.

The greater changes in elevation required in first directing the rifle on the object should be given by altering the position of the left hand under the barrel; the slighter changes only by advancing or withdrawing the shoulder.

The body not yielding to the recoil, as when firing standing or kneeling, its force, if the rifle is not properly held, may severely bruise the soldier. It is one of the objects of this exercise to so teach him that this will be prevented. Care must be

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exercised that the butt is not brought against the collar bone. By moving the shoulder slightly to the front or rear, and by moving the right elbow from the body or toward it, each soldier can determine the position in which the shoulder gives to the butt of the rifle the easiest rest. This will probably be the one in which the force of the recoil will be least felt.

The soldier should persist in this exercise until he obtains a position in which he feels no constraint, which will not subject him to bruises from the recoil and from which the mark appears plainly through the sights. Having secured such a position, he must not change it when firing, as a variation in the points of support of the rifle, the distance of the eye from the rear sight, or the tension of the hold has a decided effect, especially at the longer ranges, upon the location of the point struck.

47. USE OF SLING.—After the soldier has been drilled in the proper standing, kneeling, sitting, and prone positions in the foregoing exercise, the use of the sling will be taught. Its use is prescribed in paragraph 89. Adjustments and their advantages will be taught with the idea of noninterference with quickness and freedom of action. The trigger squeeze exercises will then be continued in the different positions, using the sling.

GENERAL REMARKS ON THE PRECEDING DRILLS.

48. The importance of sighting and position and aiming drills can not be too persistently impressed upon the soldier. If these exercises are carefully practiced, the soldier, before firing a shot at a target will have learned to correctly aim his piece, to hold his rifle steadily, to squeeze the trigger properly, and to assume that variety of position best adapted to the particular conformation of his body. This knowledge can not be successfully acquired upon the target ground. At that place the time that can be given to instruction is limited, and should be devoted to the higher branches of the subject; and even if the desired amount of attention could be given to each soldier, yet, from the circumstances of the firing, the determination of his errors can not be readily made. It is more than likely that the soldier will never discover the reasons for his failures, and will therefore be unable to properly correct them.

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Under such conditions the knowledge that he may have of the many other requisites for good marksmanship can not be utilized to full advantage, and in fact can but in a limited degree compensate for the neglect of these first principles, and for the failure to lay, by assiduously practicing them, the only firm foundation for future proficiency.

If in the instruction practice on the range it is found that the soldier makes errors in his position, he should be required to stop firing and to practice the third exercise for ten or fifteen minutes. He should be encouraged to go through these exercises frequently at other than drill hours, care being taken that for the trigger squeeze exercise he always has some definite object for a mark.

CHAPTER III.

GALLERY PRACTICE.

49. After the soldier has been thoroughly instructed in sighting and in position and aiming drills he will be exercised in firing at short ranges with reduced charges.

50. OBJECT.—The object of the practice is to continue in a different manner the instruction of the preceding exercises and to determine whether or not the soldier should be advanced to range practice.

The firing will be held standing, kneeling, sitting, and lying down. The position to be used is left to the discretion of the instructor.

51. ALLOWANCE OF AMMUNITION.—The money allowance for ammunition is fixed from time to time in general orders from the War Department, and the amount that can be used in gallery practice, after a sufficient amount has been set aside to conduct the other firing required in this manual, is discretionary with the company commander.

52. RANGE.—A range for each company will be provided near the barracks. This should be in a sheltered place where the firer will be exposed as little as possible to influences which can cause a deviation of the bullet. The range will be 75 feet.

For practice in inclement weather it is advantageous to have the range in a building. If a building is selected, one must be

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found in which the prescribed range and a strong light upon the target can be had. The light at the firing point, which need not be so bright as at the target, should, if possible, be from overhead, from the rear or from both sides, as a window at either hand only will brighten one side of the front sight, leaving the other in shadow. Windows between the firing point and the target are objectionable as giving a cross light and possibly shadows.

The target used will be the paper target X or the iron target with 1-inch bull's-eye.

53. BULLET STOP WITH PAPER TARGETS.—The form of bullet stop depends upon the kind of targets employed. These may be either of paper or iron. With the former the butt should be double, with a space of about 12 or 18 inches between the butts, the front one formed of 2-inch planks, and the second one 2-inch planks, also, but faced with sheet iron—pieces of condemned stoves or circular saws might answer. If the sheet iron can not be obtained, the space between the butts should be filled with sand, earth, or sawdust.

54. BULLET STOP WITH IRON TARGETS.—If the iron target furnished by the Ordnance Department is used, the target plate should be screwed at the corners to a screen of two thicknesses of 2-inch plank; ammunition boxes filled with earth will answer if the planks can not be obtained. The iron plate will stop by far the greater number of bullets; the wild shots will bury in the wooden screen.

The spatter of the lead ball on the iron target is its single disadvantage.

The advantages of this target are its endurance and the quickness of marking and readiness with which shot marks can be erased without disfiguring the divisions on the target.

To prevent any possible danger to the marker from stray bullets or spattering lead, in permanent galleries where a large amount of practice is held, a shelter should be constructed which, that it may not darken the target, should be at that side farthest from the principal source of light. The face perpendicular to the butt should meet it about 2 feet from the

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targets; it need not have a greater thickness than 1 inch. It will be made of boards, and should have a door 1 foot wide and 3 feet long, through which the marker can erase the shot mark on a target placed at the proper height for firing either standing, kneeling, sitting, or lying down. The other face of the shelter, parallel to the butt, should be made of a double thickness of 2-inch plank. The marker should be provided with pots of black and white paint and small brushes at the end of and perpendicular to rods about 3 feet long; these will enable him to erase the mark made by the bullet without exposing any portion of his body outside the shelter. For the practice of a single company in the company barracks this shelter will not generally be required; it will suffice for the marker to stand during the firing 4 or 5 yards to the front and to one side of the target, and to erase the shot marks after each score of five shots.

If a large iron plate can be obtained an excellent combination of butt and target can be made by using a plate of boiler iron of sufficient size to receive the impact of the wild shots.

55. SUPPORT FOR PAPER TARGETS.—If paper targets are used, they should be fastened to soft-wood boards, such as pieces of packing or ammunition boxes, and attached to the face of the butt. If the accommodations will permit, several of these targets may be so placed as to allow the simultaneous practice of four or five men and the practice conducted on the principle laid down in special course B.

As the firing is held at not more than 75 feet, the soldier can usually distinguish the effect of his shot. Marking during a score will not, therefore, be necessary, and as each squad completes its 5 shots per man, the target frames can be replaced by others ready for firing, and the targets just used prepared for future practice.

56. POSITION.—As gallery practice partakes principally of the nature of an aiming drill, it is desirable that all men be instructed in firing, kneeling, sitting, and lying, as well as in the offhand position, without regard to the relative proficiency they attain, and practice should be about equally divided between these positions; the men in all cases adopting, whether firing standing, kneeling, sitting, or lying down, the particular variety

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of that position which seems to be best adapted to their individual peculiarities.

57. VALUE OF GALLERY PRACTICE, THE APPLICATION OF POSITION AND AIMING DRILL.—Many of the external influences, which on the range affect the firer, being absent, it is possible to apply the details of position and aiming drills to actual firing. The soldier should be constantly reminded of the directions given in the sighting and position and aiming drills. There being no recoil to induce nervousness or flinching on the part of the firer, the great advantage of this gallery practice lies in the opportunity to teach the trigger squeeze.

58. SCORES.—Gallery practice will be conducted in scores of 5 shots, the number of such scores to be fired by any man at a single practice being determined by the company commander.

No reports of the results of the firing will be required, but a record of it should be kept in the company for the instruction and guidance of the soldier.

59. GALLERY INSTRUCTION PRACTICE.—This practice is held at ranges of 50 and 75 feet. A suitable and safe backstop will be provided. Either the iron or paper target X can be used. If accommodations will permit, several paper targets can be used so as to allow the simultaneous practice of three or four men. The effect of the shot at this practice can be seen from the firing point. Each hit on the paper target should be marked by a red pencil or painted out on the iron target. This should be done between scores.

If the bull's-eye on the paper target becomes too much cut up, one or more black pasters can be pasted on it, care being taken not to change the shape or size of the bull's-eye in doing so. The practice is held first in the prone position with a rest, then in the prone, kneeling, sitting, and standing positions, preferably in the order given.

The instructor can vary this instruction as he thinks necessary, but a minimum of 10 shots in each position is required for those for whom this practice is prescribed. Instruction in rapid fire is recommended where practicable.

60. TEST OF PROFICIENCY IN GALLERY PRACTICE.—The soldier having fired the required instruction practice will, after such additional practice as the company commander deems necessary,

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be required to fire the proficiency test, which is as prescribed in the following table:

Gallery practice test, slow fire.

Range (feet).	Targets.	Position.	Time limit.	Scores.	Percentage required to qualify.
50	X	Standing.	A maximum of 1 minute to each shot; time counted from execution of "Ready" to delivery of shot.	2	80
50	X	Kneeling.		2	80
75	X	Sitting.		2	80
75	X	Prone.		2	80

Should the soldier not make the required percentage for proficiency, he will be required to repeat the preliminary drills. Should he again fail he will be advanced to instruction practice, marksman's course, but no soldier who fails at the second trial of the gallery practice test will be permitted to take the record practice marksman's course, except as indicated in paragraph 97. Troops firing special course A will take both the instruction and record practice therein, regardless of the scores made in the second trial at the gallery practice test.

61. INTEREST.—The attention of the men to pointing and aiming drills soon flags, while gallery practice arouses and retains their interest; it also awakens the spirit of emulation in the soldier, without which any considerable degree of progress can not be made. To the instructor it affords the best opportunity for correcting the positions and errors of the men, and if carefully conducted the soldier who afterwards practices on the range with full charges will, as soon as he becomes accustomed to the recoil, find it a simple matter to make scores which before seemed for him impossible.

62. MATCHES.—Matches in gallery firing between the men, particularly the recruits, and between teams of the same or dif-

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ferent companies, should be promoted and encouraged. While increasing the interest of the men in their practice, they at the same time afford experience in the conditions of competitive firing.

CHAPTER IV.

DEFLECTION AND ELEVATION CORRECTION DRILLS.

63. ELEVATION.—The instructor will show the men the graduations on the rear-sight leaf, and will explain to them the value of the different divisions. He will explain to them how to adjust their sights for different distances. He will make it clear that raising or lowering the slide on the rear-sight leaf has the effect of raising or lowering the point struck. The amount of change which a given amount of elevation will cause in the point struck varies with the gun and the ammunition used.

64. DEFLECTION.—The instructor will explain how to move the movable base by use of the windage screw; that the graduations on the rear end of the movable base are for convenience in setting the sights and applying corrections; that each division is called a point of windage; that turning the movable base of the rear sight to the right or left changes the point struck to the right or left; that to overcome the drifting effect of a wind from the right the movable sight base must be moved to the right, and if the wind be from the left the movable sight base must be moved to the left. The value of the smallest graduation (one point) on the wind gauge is 4 inches on the target for each 100 yards of distance.

65. THE ZERO OF A RIFLE.—The graduations for the rear sight are correct only for the particular conditions existing when they were experimentally determined; consequently, in setting the sight for elevation at any range, allowance must be made for whatever change in elevation the difference between the former and the present conditions produces. It will thus be found that at any particular range, as 300 yards, in order to hit the mark, it will be necessary to set the sight at an elevation below or above the point marked 300 on the rear-sight leaf, say at 275 or 325 yards. The amount of correction neces-

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sary to be applied at any range is called the "zero" of that particular rifle at that range and is plus or minus, depending on whether the amount of correction necessary must be added to or subtracted from the reading on the scale. If no correction is necessary, the rifle is said to "shoot to the mark." The correction necessary for each particular rifle at each range is found by actual shooting on the range and is constant with the same ammunition and when firing under the same conditions. The zero in windage for the rifle can be determined in the same manner.

66. SIGHT CORRECTION.—The soldier may find when firing at a target that the first shot has missed the bull's-eye, and in order to cause the second to hit two methods may be used: The point of aim may be changed or the sights may be moved and the same point be aimed at. In order to do accurate shooting it is essential to have a well-defined mark at which to aim; consequently, except for slight corrections, the method of changing the elevation and windage is devised. It has before been stated that each point of windage on the rear sight base corresponds to a change of 4 inches in the point struck on the target for each hundred yards of distance. The change in elevation necessary to effect a certain change in height in the point of the target struck depends on several factors. Roughly stated, the elevation necessary on the rear sight leaf to effect a change of 1 inch on the target is as follows:

Range, yards.	Elevation, yards.
100	35
200	16
300	9
400	6
500	4
600	3
700	2
800	2
1,000	1

67. EXERCISE.—To give the soldier practice in correcting elevation and windage, a target should be placed on the wall

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facing the squad and a black paster attached a foot or more from the bull's-eye, at first directly above or below the bull's-eye, then on a horizontal line with it, and finally in an oblique direction. For this drill the rifle of each soldier who has not determined the "zero" of his rifle will be assumed to shoot on the mark.

Announce the range and tell the men that the paster represents the position of an assumed hit and require each man to correct his sights so as to bring the next hit into the bull's-eye. This exercise should be repeated daily during gallery practice until the men have acquired accuracy in making corrections for all ranges up to 1,000 yards.

68. THE EFFECT OF THE WIND.—It is important that before going on the range the soldier should be taught to estimate the force and direction of the wind and the amount of correction necessary to apply to the rear sight to overcome the effect of the wind on the bullet in its flight.

The direction of the wind is, for convenience, expressed by a clock-face notation, the clock face being supposed to lie on the ground with the hour XII toward the target or mark and the hour III at the firer's right hand. A wind blowing from the front (that is from the direction of the target) is called a XII o'clock wind, one directly from the left and across the line of fire is called a IX o'clock wind, and so on. The direction of the wind can be obtained by observing its effect on smoke, on trees, or grass, or dust, or by wetting the finger and holding it up.

The force of the wind is designated in miles per hour. An anemometer should be placed near the barracks, where it will not be exposed to cross currents and so that the dial can be readily seen. The force of the wind can then be read from the dial and at the same time the effect of the wind on the boughs of trees, flags, and streamers, and the smoke from chimneys should be observed. The soldier should be required to estimate the force of the wind and then verify his estimation by anemometer readings. This exercise should be frequently repeated, until the soldier has learned to roughly estimate the force of the wind without the aid of the anemometer. Heat waves, when present, are an important aid in estimating the force of the wind.

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69. SIGHT CORRECTIONS FOR WIND.—The wind which causes the greatest deflection in the flight of the bullet is one blowing directly across the range (from III or IX o'clock); if the same wind blows from II, IV, VIII, or X o'clock, the resulting deflection is less than when the wind blows directly across the range. To counteract or compensate for wind deflection, a certain number of points of windage must be set off on the rear sight. The following table shows how many points must be used at the various ranges for ten-mile-an-hour wind from each of the various directions. Since the deflecting power of a wind is directly proportional to its velocity, the proper corrections for any velocity of wind may be readily computed from the following table taken from the "Target Range Pocket Book" (Ordnance Publication No. 1998):

Preliminary instruction and drills for rifle.

[Points of windage necessary to correct for a ten-mile-an-hour wind.]

Range (yards).	III to IX points.	II, IV, VIII, X points.	I, V, VII, XI points.
100	0.2	0.2	0.1
200	.4	.4	.2
300	.7	.6	.3
400	.9	.8	.5
500	1.2	1.0	.6
600	1.5	1.3	.7
700	1.8	1.6	.9
800	2.2	1.9	1.1
900	2.5	2.2	1.3
1,000	2.8	2.4	1.4

Winds blowing from XII and VI o'clock directions have no deflecting influence on the flight of the bullet, but these winds have the effect of shortening (in the case of XII o'clock winds) or lengthening the range (in the case of VI o'clock winds). The correction necessary to apply in the case of such winds is very small; at 1,000 yards a ten-mile wind at XII o'clock will necessitate an increase of 25 yards in elevation, and if blowing from VI o'clock, a decrease of 27 yards in elevation. In prac-

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tice it will be found better not to charge the soldier's memory with too many figures. He should be instructed to estimate with care the elevation and windage necessary for his first shot, and, having set his sights, to aim at the mark. If his aim on the first shot is satisfactory and the point struck can be seen, the correction necessary to obtain a hit can be made with accuracy.

Exercises in setting the sights for winds of given velocities and directions, when firing at specified ranges, should be given the soldier until he has mastered the details of this subject.

70. USING THE BULL'S-EYE AS A UNIT OF MEASURE.—The average man finds it very confusing to retain in his mind the figures necessary to make accurate sight corrections. To avoid this difficulty, a unit of measure that is constantly in his sight while on the range and that he can easily remember when firing at a corresponding distance in field practice may be adopted. This is the bull's-eye of the target for the range at which he is firing. The corrections necessary, on the rear-sight leaf and wind gauge, to move the point struck the width of the bull's-eye of the rectangular target corresponding to that range are given below:

Range (yards).	Elevation (yards).	Windage (points).
200	100+	1
300	75	1
500	75	1
600	60	1−
800	60+	1+
1,000	36	1−

NOTE.—The sign + after a number in the above table indicates that the correction necessary is slightly more than that given; the sign —, that the correction necessary is slightly less than that given.

71. REMARKS.—If the soldier is well drilled in applying the windage and elevation corrections necessary to bring an assumed hit into the bull's-eye, using in turn each of the bull's-eye targets at which he fires on the range, he will need very little

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further instruction in applying the necessary corrections. The instructor should assure himself that the men understand the reasons for these corrections and they should never forget that they must move the rear sight movable base *into the wind and in the same direction* they wish to move the point struck.

CHAPTER V.

ESTIMATING DISTANCE DRILLS.

72. IMPORTANCE.—The ability to correctly estimate distance is an essential characteristic of the good shot, and therefore forms an important element in the education of the soldier.

Distances can be estimated by means of range-finding instruments, by eye, by sound, and by trial or volley shots. In a majority of cases, on the battlefield, the distance must be estimated by eye.

While it is true that in the controlled fire of a company on the battlefield the range will be given by the company officers, the battlefield is only reached after a long series of experiences in scout, patrol, and outpost duty, in which the soldier is frequently placed in positions where it is essential that he shall determine for himself the range to be used in order that his fire may be effective. It is, therefore, here made a prerequisite to qualification as a marksman, sharpshooter, or expert rifleman that the soldier shall be proficient in estimating distances by the eye.

This course, while it will be taught and practiced throughout the year in connection with practice marches and field maneuvers, will be systematically taken up by the company during the two weeks immediately preceding range firing. It will not be conducted to the exclusion of other drills and practice.

73. UNIT OF MEASURE; INSTRUCTION AT SHORT DISTANCES.—To estimate distance with accuracy, it is necessary to be familiar with the appearance, as to length, of a unit of measure which can be compared mentally with the distance which is to be estimated. The greater portion of the soldier's practice on the range is carried on between the distances of 200 and 600 yards from the targets. He can readily familiarize himself

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with the appearance of targets, of men, and of other objects at any of these ranges. If the unit assumed is too short, the error in estimating long distances is greatly increased because of the difficulty of applying the short unit at a considerable distance from the soldier. For ranges up to 500 yards the soldier should be taught to use a unit of 50 yards. For distances greater than 500 yards the unit should be 500 yards, and the soldier will be taught that having applied the larger unit as many times as it is contained in the estimated distance, the remaining distance can be estimated by application of the shorter unit. To impress upon the soldier the appearance of the shorter unit two stakes should be driven into the ground, near the barracks, a measured distance of 50 yards apart. The soldier will be required to frequently pace the distance between the stakes, counting his steps. He will thus become familiar, not only with the appearance of the smaller unit on the ground, but will also learn how many of his steps make 50 yards. Next the instructor will plainly mark the larger unit (500 yards) in two or more localities, and will require the soldier to pace the distances, where possible, and to thoroughly familiarize himself with the appearance of objects, especially men, at the distance of the larger unit. He should be required to do this while in the prone position as well as while standing. A longer unit should be laid out on level ground that is free from obstruction. The ground selected for the other longer units should be up or down hill, over water or through a grove of trees, to accustom the soldier to the appearance of the unit under varying conditions of terrain.

The soldier should be taught that in judging the distance from the enemy his estimate may be corrected by a careful observation of the clearness with which details of features, dress, the movements of limbs or of the files in a line may be seen. In order to derive value from this method, the soldier will be required to observe closely all the details noted above in single men or squads of men posted at varying distances which will be measured and announced.

Although the standing and kneeling silhouettes used in field practice afford good fixed objects upon which to estimate distances, the instructor should make frequent use of living figures and natural objects, as this is the class of targets from which

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the soldier will be compelled to estimate his range in active service.

74. METHODS OF ESTIMATING LONG DISTANCES BY THE EYE.—The following methods are found useful:

(*a*) The soldier may decide that the object can not be more than a certain distance away nor less than a certain distance; his estimates must be kept within the closest possible limits and the mean of the two taken as the range.

(*b*) The soldier selects a point which he considers half the whole distance, estimates this and doubles it, or he similarly divides the distance into a certain number of lengths which are familiar to him.

(*c*) The soldier estimates the distance along a parallel line, as a road on one side, having on it well-defined objects.

(*d*) The soldier takes the mean of several estimates made by different persons. This method is not applicable to instruction.

75. APPEARANCE OF OBJECTS; HOW MODIFIED BY VARYING CONDITIONS OF LIGHT; DIFFERENCE OF LEVEL, ETC.—During instruction the men should be taught the effect of varying conditions of light and terrain upon the apparent distance of an object.

Objects seem nearer:

(*a*) When the object is in a bright light.

(*b*) When the color of the object contrasts sharply with the color of the background.

(*c*) When looking over water, snow, or a uniform surface like a wheat field.

(*d*) When looking from a height downward.

(*e*) In the clear atmosphere of high altitudes.

Objects seem more distant:

(*a*) When looking over a depression in the ground.

(*b*) When there is a poor light or a fog.

(*c*) When only a small part of the object can be seen.

(*d*) When looking from low ground upward toward higher ground.

76. ESTIMATING DISTANCE BY RANGE-FINDING INSTRUMENT.—One Weldon range finder with steel tape for measuring a base is issued to each company of infantry and engineers and each troop of cavalry. A description of the instrument and instructions for its use are published by the Ordnance Department and issued with the instrument. Accuracy in finding the range de-

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pends upon care and facility in use of the instrument and clearness of definition of the objective. Correct knowledge of the use of the instrument is essential to all officers and should be imparted to sergeants when time is available.

77. ESTIMATING DISTANCE BY SOUND.—Sound travels at the rate of about 1,100 feet, or 366 yards, per second. If a gun is fired at a distance a certain time elapses before the sound is heard. If the number of seconds or parts of seconds between the flash and the report be carefully taken and multiplied by 366 the product will be approximately the distance in yards to the gun. This method will be of doubtful use on the battlefield, owing to the difficulty of distinguishing the sound of the gun whose flash is seen from that of any other. It will probably be useful in determining the range to a hostile battery when it first opens fire.

78. ESTIMATION OF DISTANCE BY TRIAL SHOTS OR VOLLEYS.—If the ground is so dry and dusty that the fall of the bullets is visible through a glass or with the naked eye, a method of determining the distance is afforded by using a number of trial shots or volleys.

The method of using trial volleys is as follows:

The sights are raised for the estimated range and one volley is fired. If this appears to hit but little short of the mark an increase of elevation of 100 yards will be used for the next volley. When the object is inclosed between two volleys, a mean of the elevations will be adopted as the correct range.

The range may be obtained from a near-by battery or machine gun, and this is the best method where available.

79. ESTIMATING DISTANCE TEST.—When the above instruction shall, in the opinion of the company commander, have progressed to such an extent as to enable the soldier to judge distances with the eye with fair accuracy, he will be tested for proficiency.

As the point-blank range for the rifle with the rear sight leaf laid flat (battle-range sight) is 530 yards, and the dangerous space is, for such a range with the sight described continuous for a man kneeling, the soldier will not be tested for proficiency within that distance, and as individual fire and the fire of small squads will ordinarily be limited to 1,200 yards, he will not be tested for proficiency for distances beyond 1,200 yards.

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The rules governing this test are as follows:

(*a*) Each soldier will be tested separately.

(*b*) The ground over which the test is made shall be other than that over which he fires or has previously estimated distances.

(*c*) One or more courses will be laid off radiating from the estimating points and not in the immediate vicinity of the post. No two estimates for any one man will be made over the same course.

(*d*) But one objective, to which the range is to be estimated, will be used on any one course. The use of any device to mark the limits within which distances are estimated, at the time the test is given, so that this device can be seen from the estimating point, is prohibited.

(*e*) The objective will be a man standing, kneeling, or prone. He will be placed at some point on the course more than 500 yards and less than 1,200 yards from the instructor. Each 50 yards of the course which he is to follow will be marked by a small peg or stake rendered invisible from the estimating point and marked with a number which can be seen by the man acting as the objective. The instructor, having selected an intelligent soldier to act as an objective on each course, will place him on the course marked as above and having furnished him with a pencil and paper will instruct him that he is to record, in order, the number of yards from the estimating point each time he is halted. The instructor then goes to the estimating point and calls up one of the soldiers to be tested. He then signals to the soldier acting as objective on one of the courses to move away from him or toward him; halts him when he has attained the desired distance and signals him to kneel or lie down.

The soldier being tested will then be told to estimate the distance to the man acting as objective. He will be allowed fifteen seconds for this purpose, counting from the time the objective halts, the time being taken by the instructor. For each five seconds or fraction thereof over fifteen seconds required by the soldier to announce his estimate, a total of 5 points will be deducted from the percentage made for accuracy. This process will be repeated for each of five courses. At least two estimates will be made with the soldier taking the test in the prone position. The soldiers undergoing test will not be allowed to know the position of the pegs with reference to other objects nor to

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leave the estimating point until the five estimates are concluded. The position of the pegs will be changed for each day's test. While the objective is moving, the man who is undergoing test will be required to turn his back on the objective. When the test for the day is completed for any man, he will not be allowed to join the squad awaiting test.

(*f*) Proficiency for expert riflemen will consist in making in any five consecutive estimates an average of 90, after deducting from the percentage for accuracy the specified points for time, as in (*e*). For sharpshooter the average required as above will be 85, and for marksman 80.

(*g*) The soldier will be tested for each year's classification, unless he attains the classification of expert rifleman, when he will be excused from further test until he is again required to fire the marksman's course.

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PART III.

KNOWN DISTANCE PRACTICE.

80. GENERAL DESCRIPTION.—The soldier having complied with the requirements of paragraph 60, is advanced to known distance firing on the class A range. The general scheme, arranged according to courses and classes of fire, without regard to chronological sequence, is set forth in the following synopsis:

- KNOWN DISTANCE PRACTICE.
  - Regular courses.
    - Marksman's course
      - Instruction practice: Slow fire. Rapid fire. Skirmish fire.
      - Record practice: Slow fire. Rapid fire. Skirmish fire.
    - Sharpshooter's course
      - Instruction practice: Slow fire. Rapid fire.
      - Record practice: Slow fire. Rapid fire.
    - Expert rifleman's test
      - Instruction practice: Instruction, field practice.
      - Record practice: As prescribed.
  - Supplementary course.
  - Special courses.
    - Special course A
      - Instruction practice: Slow fire. Rapid fire.
      - Record practice: Slow fire. Rapid fire.
    - Special course B
      - Instruction practice: Slow fire. Rapid fire.
      - Record practice: Slow fire. Rapid fire.
    - Special course C
      - Marksman's record course: Slow fire.
      - Sharpshooter's record course: Slow fire. Rapid fire. Skirmish fire.
      - Expert rifleman's record course: Slow fire.

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81. SCHEME.—The scheme of known distance practice is progressive in character. It requires first a thorough period of educational firing, more or less extended according to individual requirements, called "instruction practice;" second, a short period of test firing, alike for all who take it, called "record practice." The combination of these two classes of practice constitutes the subdivision of range practice called the "marksman's course."

The scores made by the soldier in record practice, marksman's course, determine his fitness to progress to more difficult and longer range shooting. If he has fallen short of the totals required to qualify him as a marksman, he will do no more known distance practice that regular practice season and will be reported as unqualified.

If, however, he has attained the record required for a marksman, he progresses to the sharpshooters' course, where, after a period of instruction practice, he follows the prescribed record practice, and if successful in making the requisite record scores for sharpshooter in that course, he is then entitled to a trial in the next higher course of firing, called the "expert rifleman's test." This differs from the courses that precede it in that there is no prescribed instruction practice. (See paragraph 97.) As soon as the sharpshooter's course is completed for those entitled to take it, all soldiers are required to participate in a special class of firing preparatory to field firing and the expert rifleman's test.

82. SUPPLEMENTARY COURSE.—For recruits who join too late to fire in the regular season the post commander will designate a period as nearly as practicable, midway between the annual seasons, which will be utilized in giving them such instruction practice as the allowance of ammunition available will permit. This instruction should not be less than that prescribed in Special Course A, slow fire, instruction practice, and will always be preceded by a thorough course of preliminary drills.

83. SPECIAL COURSES.—Special courses A and B are prescribed for practice at posts unprovided with complete ranges. They may be used during the supplementary season when climatic conditions prevent the prosecution of the full course. Special Course C is prescribed for the use of the organized militia of the United States.

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CHAPTER I.

ADVICE TO RIFLEMEN.

84. (*a*) Before going to the range, clean the rifle carefully, removing every trace of oil from the bore. This can best be done with a rag saturated with gasoline. Put a light coat of oil on the bolt and cams. Blacken the front and rear sight with smoke from a burning candle or camphor, or with liquid sight black.[a]

(*b*) Look through the bore and see that there is no obstruction in it.

(*c*) Keep the rifle off the ground; the stock may absorb dampness, the sights may be injured, or the muzzle filled with dirt.

(*d*) Watch your hold carefully and be sure to know where the line of sight is at discharge. It is only in this way that the habit of calling shots, which is essential to good shooting, can be acquired.

(*e*) Study the conditions, adjust the sling, and set the sight before going to the firing point.

(*f*) Look at the sight adjustment before each shot and see that it has not changed.

(*g*) If sure of your hold and if the hit is not as called, determine and make the FULL correction in elevation and windage to put the next shot in the bull's-eye.

(*h*) Keep a written record of the weather conditions and the corresponding elevation and windage for each day's firing.

---

[a] SIGHT BLACK (LIQUID).—Ivory black, "B," in Japan (a black paste obtainable from dealers in painter's supplies in 1-pound cans), 5 ounces.

Gasoline, 76 test, 12 ounces. Add the gasoline little by little to the paste, mixing thoroughly after each addition. If it is found to dry with any gloss whatever, there is too much "binder" in the paste. To correct this add to the paste a little powdered lampblack and work up thoroughly with the first portion of the gasoline which is added.

Gasoline is used to thin the paste because of its quick drying properties. This mixture will dry on the sights in a few seconds.

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(*i*) Less elevation will generally be required on hot days; on wet days; in a bright sunlight; with a VI o'clock wind, or with a cold barrel.

More elevation will generally be required on cold days; on very dry days; with a XII o'clock wind; with a hot barrel; in a dull or cloudy light.

(*j*) The upper band should not be tight enough to bind the barrel.

(*k*) Do not put a cartridge into the chamber until ready to fire. Do not place cartridges in the sun. They will get hot and shoot high.

(*l*) Do not rub the eyes—especially the sighting eye.

(*m*) In cold weather, warm the trigger hand before shooting.

(*n*) After shooting, clean the rifle carefully and then oil it to prevent rust.

(*o*) Have a strong, clean cloth that will not tear and jam, properly cut to size, for use in cleaning.

(*p*) Always clean the rifle from the breech, using a brass cleaning rod when available. An injury to the rifling at the muzzle causes the piece to shoot very irregularly.

(*q*) Regular physical exercise, taken systematically, will cause a marked improvement in shooting.

CHAPTER II.

REGULATIONS FOR KNOWN DISTANCE PRACTICE.

85. ALLOWANCE OF AMMUNITION.—The annual allowance, in money, for ammunition, is prescribed from time to time in orders from the War Department. This allowance is for all classes of ammunition including blanks. At the present time the money allowance for rifle firing of an infantry soldier is $12.60. As an indication of the number of rounds available for each class of firing, the following example will suffice:

100 rounds blank (probable requirement)	$2.03
Gallery practice, 200 rounds ball, caliber .22	.41
Marksman's course, record, 104 ball, caliber .30	3.32

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Sharpshooter's course, record, 35 ball, caliber .30	$1.12
Expert rifleman's test, 50 ball, caliber .30	1.60
Total cost of original ammunition	8.48

Using fired shells on hand, the cost of reloading ammunition is $14.65 per thousand. Using reloaded ammunition for the instruction practice, markman's and sharpshooter's course (130 rounds) the cost will be $1.90. The balance remaining for use in field practice will therefore be $2.22, besides the allowance for fired shells turned in, an equivalent of 69 rounds original ammunition or 150 reloaded rounds of ammunition for use in the proficiency test and field practice. It is to be noted that the above computation is for a soldier whose known distance practice is the maximum required for any one year. For men who have qualified in prior seasons, during any enlistment, or who fail to attain the grade of marksman, the number of rounds required for known distance practice will be much reduced.

86. TARGET YEAR AND PRACTICE SEASON.—The target year, being the period for which reports are rendered and which must include the practice season, will commence January 1, and terminate December 31. In the Philippine Islands these dates will be varied as required.

The practice season will be divided into two periods, one of three months, not necessarily consecutive, called the regular season, and the other the period designated by the post commander, called the supplementary season. The months constituting the practice season will be designated by the department commanders. During the period designated as practice season, firing on the Class A range will be prosecuted in such a manner that, while the record firing should take place on the most favorable days and under the most favorable circumstances, the men should be instructed and required to practice under variable conditions of weather, being careful that the shooting is not held under conditions so adverse or difficult as to make the shooting of no profit to the men. The usual drills and instruction of troops will not be suspended more than is actually necessary, but the post commander will so regulate them that the instruction and firing will not be hurried.

In the regular season the prescribed course will be carried to completion, all the officers and enlisted men who are required to

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fire taking part. Recruits who join too late to fire in the regular season will fire the instruction practice prescribed in paragraph 82 in the supplementary season.

The main object of the supplementary season is to insure against the continued presence of a large number of recruits who have had no instruction in firing.

87. WHO WILL FIRE.—It is desirable that all men leaving the company shall have received some instruction, because one object of target practice is, as far as practicable, to disseminate among the people the knowledge taught; therefore all officers and enlisted men enumerated below, present at the post during any part of the practice season, will take the prescribed course of rifle practice so far as the period of their service permits. A soldier who has completed the course of known distance practice and is transferred thereafter, will not be given a second opportunity in the same target year to qualify unless he shall have been discharged and reenlisted. Men who join within twenty days of the end of the practice season are permitted, but not required, to fire. In this connection attention is invited to the provisions of paragraph 86.

The following table designates those who are required or authorized to fire at known distance practice:

Arm or corps.	To fire.
1. Infantry and battalions of engineers..	Battalion staff and company officers and all enlisted men.
2. Cavalry	Squadron staff and troop officers and all enlisted men.
3. Coast artillery	Special course A. Company officers and all enlisted men of companies.
4. Staff departments, except medical	All officers and enlisted men authorized but not required.
5. Staff corps	
6. Veterinarians	
7. Regimental field and staff officers of infantry and cavalry, and field and staff officers of the coast artillery corps	
8. Post and coast artillery noncommissioned staff	

All officers enumerated in the above table of over fifteen years' commissioned, or commissioned and enlisted service in

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the Regular Army, or who have completed five regular seasons' practice, or who have qualified as expert riflemen, are authorized, but not required to fire.

A soldier having qualified in any course will not again fire that course in his current enlistment. He will begin his regular practice in each enlistment with the marksman's course.

Trumpeters and company musicians will take the prescribed course in rifle practice.

Bandsmen will not fire, except in the Philippines when required to do so by the division commander. Upon recommendation of the surgeon, the post commander may excuse officers and men from practice. As all enlisted men are required to fire in the proficiency test, the necessity of training for all is apparent.

Subject to the provisions of paragraph 350, rifle firing in the Philippines division may be varied as the division commander may direct.

88. RESTRICTIONS AS TO THE ARM.—The object of all instruction, of which range firing merely forms one of the steps, is to increase the soldier's accuracy of fire with the small arm as he will take it into action. It is, therefore, requisite that his practice should be conducted with the rifle or revolver exactly as it is supplied by the department having charge of the fabrication of arms, except that the sights may be blackened if desired. The use in practice of additional appliances, such as temporary shades for the sights, detachable spirit levels, orthoptic eyepieces, etc., which in the field would practically never be applied to the rifle or used in aiming, and would only make the soldier dependent upon conditions unlike those which obtain in battle, is prohibited. The front-sight cover, however, being a necessary adjunct for the proper protection of the sight, will be kept on the rifle at all times, except during practice, when its use is optional. Telescopic sights issued to expert riflemen may be used in field practice. In the regular practice the firing must be held "in the open" and not from any sheds or shelters. The troops in each organization will use, in small-arms practice, the weapon with which they are armed. Infantry and coast artillery will, therefore, practice with the rifle; cavalry with the rifle and revolver, and field artillery with the revolver.

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Small arms and appliances issued by the Ordnance Department for test and report will not be used in determining classification.

89. USE OF GUN SLING.—The gun sling may be used at all ranges as an auxiliary to steady the piece, in connection with one arm only, provided that for the purposes of adjustment for shooting, neither end shall have been passed through either sling swivel. No knot will be tied in the sling and the sling itself will not be added to or modified in any manner.

90. USE OF RESTS.—In no class of known distance practice other than in the expert rifleman's test will a rest for the rifle or for any part of the body be allowed except as prescribed in the prone, kneeling, and standing positions, or as authorized for the sitting position. Within the limitations of these regulations the position which the soldier can take with the greatest ease and steadiness should be adopted.

91. USE OF DEVICES FOR DETERMINING FORCE AND DIRECTION OF WIND.—Anemometers, wind clocks, and other instruments, and flags, vanes, or streamers for determining the force or direction of the wind, while authorized in instruction preliminary to range firing, will not be permitted on the range.

92. DRESS AND EQUIPMENT.—In all classes of firing the service uniform will be worn. The coat may be omitted for enlisted men when authorized by the post commander. In all known distance practice, except skirmish fire, the soldier will be equipped with the rifle and cartridge belt. In skirmish fire dismounted troops will be equipped with the rifle, bayonet, and scabbard, cartridge belt, canteen, and haversack, the latter containing the prescribed field mess kit; mounted troops will be equipped with the rifle and cartridge belt, revolver and holster, canteen, spurs, and straps. In all firing, mounted officers will be equipped as are mounted troops and dismounted officers as are dismounted troops. Cartridge-belt suspenders will always be worn with the belt.

93. PRACTICE OF CASUALS.—All officers and enlisted men not required to fire, but who nevertheless do so, will be attached to organizations for practice and will be classified on the report of the organization with which they fire.

94. INSTRUCTION PRACTICE.—The amount of instruction practice in any course is within the discretion of the company commander, provided that the minimum prescribed for that

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course is fired. Details of position and order of fire for practice other than for the minimum prescribed may be modified to suit the requirements of each particular case. Practice with the battle sight in this class of fire will be encouraged.

Company commanders will so regulate the expenditure of ammunition in instruction practice that, while retaining a sufficient amount for the required record course, field firing, expert rifleman's test, and proficiency test, the inexperienced shot will be given ample opportunity to determine the nature of his errors while firing with service charges and the best method of correcting them. The firing in this practice by an individual of more than 40 rounds per day is prohibited.

Although not prescribed, it will be found that in some instances instruction practice may well be commenced with some firing at 100 yards or in the prone position at 200 yards.

For those required to fire the gallery test, and who have failed to qualify therein, the company commander will, after permitting them such preliminary range firing as may be deemed necessary, cause them to fire the minimum prescribed for instruction practice, marksman's course, paragraph 137, and will record the scores made.

95. RECORD PRACTICE.—Record practice differs from instruction practice in that instruction is not the only object sought. The main purpose is twofold: First, to afford the soldier an object lesson of his progress, thus sustaining and stimulating his interest; second, to obtain a record by means of which the soldier may be graded in awarding insignia and increased pay.

From the nature of record practice its rules must be fixed and applicable to all alike; these rules must be observed with unswerving impartiality, scores must be recorded with the strictest accuracy, and the work in the pit must be conducted with the greatest efficiency.

In this practice "coaching" and "spotting" are prohibited. Each firer will observe the location of each of his hits. After the soldier has taken his place at the firing point no person shall render or attempt to render him any assistance whatever.

This practice will be conducted with the particularity of the regulations governing competitions, except that in a continuous pit there will be one officer to every three, or fraction of three, targets, and in each single target pit there will be an officer. From time to time checks on the scoring and marking will be

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made under the supervision of the commanding officer. This can be done whenever new paper targets are put on or by marking each shot in the target with red pencil at the end of each day's firing and proceeding as in paragraph 107. This check will be noted on the annual company report of known distance firing and classification.

96. FIELD GLASSES.—Field glasses or telescopes will be carried by all officers, except when they are actually firing. The men should be encouraged to use them on the range when not firing their record scores. Full advantage will be taken of their use in instruction practice. Information obtained by their use in record practice at any range will not be imparted to the firer until his total scores at that range are fired.

97. ORDER OF PROCEDURE.—The practice season opens with instruction practice, marksman's course. This is carried to completion for each soldier, through slow, rapid, and skirmish fire, before proceeding to record practice for that soldier. When the instruction practice, marksman's course, is completed the soldier proceeds to record practice, same course, and follows this practice to completion in the order prescribed in the table. If, however, the soldier has twice failed in the gallery practice test he will not be advanced to record practice unless in the instruction practice, marksman's course, fired and scored as directed in the last clause of paragraph 94, he shall have made a total of 250 points. If the soldier qualifies as a marksman in the marksman's course, he then proceeds with instruction practice, sharpshooter's course which, when finished, is followed by record practice, same course. For any individual, in any course, record practice will never take place on the same day with any part of instruction practice in the same course.

The sharpshooter's course will be followed by instruction field practice (Chapter IV, Part IV), and the latter by the expert rifleman's test.

When a soldier completes his instruction practice in any course he may begin record practice in that course without waiting for others less advanced. Having entered upon record practice, he will do no other firing until that practice is completed. Sighting shots form no part of the score and are not recorded as such; they are not included in the computation of the time limit. Where sighting shots are prescribed the soldier has no option, but must fire all prescribed. A record practice

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score for any individual once begun at a range will be continued to completion at that range without interruption, and if at a range where sighting shots are prescribed, the practice will begin with the first sighting shot. A record-practice run, skirmish fire, in any individual case, will be completed on the same day on whch it is begun.

The several runs or scores at any range comprising record practice may be fired on different days. In such cases sighting shots, at ranges where required, will precede each score.

98. INSTRUCTION SHOTS.—Shots fired by an officer or an enlisted man for the purpose of instruction will be permitted only in instruction practice.

99. SUPERVISION.—The practice of the company will always be superintended by an officer.

100. SCORING.—The record of the scores from which classification will be made will be kept at each firing point by a noncommissioned officer, who will be assigned, unless at a one-company post, to a firing point where his own company is not firing. The scoring will be closely supervised and the record verified by the officer supervising the practice.

Scores will be recorded on the range in ink or with indelible pencil on memorandum sheets prepared for that purpose. A separate sheet will be kept at each range for each man firing, and as soon as the man's scores at any range for the day are completed the scorer will sign the sheet, and the officer supervising the firing will take it up, initial it, and keep it in his personal possession until he turns it over to the company commander.

The scores will be transferred from these sheets to the company target record by the company commander or the officer supervising the firing. The company target record will be kept in the personal possession of the company commander and not allowed in the hands of an enlisted man from the beginning of record practice until the required reports for range practice have been rendered. All entries in the company target record will be made in ink or with indelible pencil, and no corrections or alterations made except by the company commander, who will append thereto his initials.

101. SCORING, SLOW FIRE.—The scorer, as each shot is signaled will announce the name of the firer and the value of the hit, and will record it on the sheet assigned to that soldier.

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Shots fired upon the wrong target will be entered upon the score of the man firing as a miss, no matter what the value of the hit upon the wrong target.

If two shots strike a target at the same or nearly the same time, both will be signaled; and if a shot was just fired from the firing point assigned to that target the hit having the higher of the two values signaled will be entered in the soldier's score and no record made of the other hit by that scorer.

102. SCORING, RAPID FIRE.—In rapid fire the scorer does not announce the name of the firer after each shot is signaled. As each hit on the target is signaled it is announced; the number of misses, if any, is announced; the score is then entered, and finally the name of the firer, with his total score, is announced and the latter recorded.

In the case of two men firing in rapid fire on the same target the resulting score will be rejected, the soldier at fault being credited with only such hits, if any, as he may have made on his own target, the other soldier repeating his score.

103. SCORING, SKIRMISH FIRE.—In instruction practice such record as is prescribed by the company commander will be kept for the information of the men firing.

In record practice the record of hits will be kept in the pit. As soon as the targets are lowered after each halt the marker will call the number of hits, if any, on the figure, then the number of hits in the four space, and finally the total number of hits within the target frame. In case the number of hits within the frame (including those on the figure and in the four space) is greater than the number of shots prescribed for that halt, the soldier firing on that target will be scored zero for that halt. If the number of hits be not greater than the number of shots prescribed for the halt, the scorer will enter the score under the supervision of the officer in charge of that target. The score will be signed by the noncommissioned officer scoring, attested by the initials of the officer in charge of that target, and disposed of by him as provided for score sheets in paragraph 100. A record of such penalties as may be assigned by the officer in charge of the skirmish line will be kept by him and he will personally turn over this record to the company commander. The company commander, or an officer designated by him, will enter the penalties on the company target record.

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The following forms for scoring skirmish practice are suggested:

Record. Instruction.

—— run.

Time ——; date ——.

Targets.	Name.	Penalties.
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

Record. Instruction.

—— run; target ——.

Time ——; date ——.

PIT RECORD.

Halts.	5's.	4's.	Other hits.	Total hits.
600				
500				
400				
350				
300				
200				
Total scores				

(Sig. scorer) —— ——.

(Sig. officer) —— ——.

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104. RANGE OFFICERS.—At stations where the range is provided with several targets and practice usually held simultaneously by two or more companies and successively by others, a range officer will be appointed.

The range officer will be charged with the care and police of the range, and with the necessary repairs to the targets, shelters, butts, or firing points. In carrying out these duties he should be assisted by a noncommissioned officer and by the labor of such fatigue parties as may be required. He will make timely estimates for material and labor to place the range in thorough condition for the target season, and all necessary repairs will be made under his direction and the supervision of the post commander.

He will be responsible for the accurate measuring of the range and the correct location of the different firing points; and that the targets are at all times free from special marks that might afford undue assistance in aiming. He will be responsible for the arrangements and the efficiency of the personnel at the butts and will make frequent inspections thereof.

The range officer, who should be when practicable a field officer, will not exercise supervision of the details of the instruction of the companies practicing on the range. He will, however, maintain order, regulate the distribution of ranges and targets to organizations, report infractions of regulations and existing orders, and, in general, assist by every proper means in securing efficient, honest, and accurate service in the working force of the range. He will also see that all necessary precautions are taken for the safety of the markers and such spectators as may be present.

When ranges are not provided with butts and the surroundings are such that persons or animals might attempt to cross the range, the range officer, before firing is begun, should post lookouts, whose duties it will be to prevent any attempts to cross the line of fire. Whenever the lookouts can not prevent the line of fire being crossed, they should display a danger signal and caution the markers to withdraw the targets.

PIT REGULATIONS.

105. NONCOMMISSIONED OFFICER IN CHARGE OF PIT.—A competent noncommissioned officer, with such assistants as the post commander deems necessary, will be detailed permanently in

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charge of arrangements at the butts. He will be under the direction of the range officer, and will be responsible for the efficiency and discipline of the target details.

106. TARGET DETAILS.—The detail for marking for each target will consist of two privates belonging to the company firing at that target and one noncommissioned officer, always selected, except at a one-company post, from some other company. If the target is a type easily worked only one private will be necessary. The noncommissioned officer will be held responsible that order is kept at his target, and should be familiar with the regulations governing the markers and with the method of marking. Upon arriving at the target the noncommissioned officer in charge thereof will see that the signal flag, marking staves and disks, and pasters are provided and in good order, and, if necessary, will notify the noncommissioned officer in charge of the pit of any deficiencies. He will then display the danger signal and, examining the target carefully, will place pasters over any old shot holes, or put on a new paper target if necessary. Upon completion of the firing he will cause the target to be withdrawn from the firing position, and will then make such disposition of the danger signal and marking disks as may have been directed by the range officer. He will also report to the noncommissioned officer in charge of the pit such repairs as that target or its implements may require for a succeeding practice.

If it should become necessary before the completion of the firing for the marker to leave or for other persons to enter a target pit not provided with a continuous shelter and a covered approach, the target should first be turned or withdrawn from the firing position and the danger signal displayed. After the signal "Cease firing" has been sounded, or if there is no musician present at the firing point, after a few seconds' delay the target pit may be entered or left, the target turned back to the firing position, the danger signal removed, and firing resumed. For record firing there will be in a continuous pit one officer to every three or fraction of three targets, and in each single pit there will be an officer.

107. MARKING.—When a post is garrisoned by a single company, and it is impossible to detail noncommissioned officers of other companies to supervise the marking and scoring, these duties will be performed by noncommissioned officers of the firing company. In this case new paper targets will be used

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for each day's firing, and upon its completion the company commander, or one of his lieutenants, will count the number of hits in each division of the target and compare the totals with the recorded scores. If the value of the hits as signaled differs by more than 1 per cent from that obtained by the examination of the target, all scores as recorded for that day's firing will be canceled and not considered in any soldier's classification. Such corrective measures will also be taken as will insure accuracy on the part of the markers in future firings. As in some cases the markers may inadvertently make errors in signaling the hits, whenever an examination of the target gives results very closely agreeing with the recorded scores, the record should be permitted to stand, but the markers cautioned to exercise greater care in the future.

Any shot cutting the edge of the figure or bull's-eye will be signaled and recorded as a hit in the figure or bull's-eye, and as the limiting line of each division of the target is the outer edge of the line separating it from the exterior division whenever this line is touched by the shot, it will be signaled and recorded as a hit in the higher division.

In record firing the officers detailed in the pit will verify every miss before it is signaled, and will closely observe the marking on the targets to which they are assigned to prevent fraud or errors on the part of the marker.

108. MARKING, SLOW FIRE.—In slow fire with the rifle, as each shot is fired, the noncommissioned officer indicates to one of the markers the value and position of the hit, if any is made, and supervises this marker while he signals (being careful to place the center of the disk over the shot hole) the result of the shot to the firing point as follows:

If a bull's-eye, with a white disk.

If a center, with a red disk.

If an inner, with a black and white disk.

If an outer, with a black disk.

If but one private is detailed at the target, the noncommissioned officer will himself signal the hit.

In slow fire with the revolver but two disks are used, one a white disk to indicate a bull's-eye, the other a black disk to indicate all other hits. On one side of the target is pasted a column of figures from 2 to 5, inclusive, and on the other side a column of figures from 6 to 9, inclusive. These numbers should

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be large enough to be plainly seen at 75 yards. When a bull's-eye is made, the white disk is placed with the center of the disk over the hit. When a hit on any part of the target other than the bull's-eye is made, the black disk is placed on the number indicating the value of the hit, and after a slight pause is placed so that the center of the disk is over the shot hole.

In marking both the rifle and revolver targets the following will govern:

If a ricochet, by displaying the ricochet flag, and if the target is hit, by placing over the shot hole the appropriate disk. Ricochet flags are white flags with red centers similar to those used in signaling, the size depending on the distance.

If a miss, by waving the danger flag across the front of the target.

If the markers are certain on which side of the target the miss is made, the flag will also be waved on that side.

After the result of the shot has been signaled, the other marker, if a direct or ricochet hit has been made, will reverse the target and place the proper paster over the shot hole.

An alternative method of marking slow fire with the rifle at mid and long ranges is recommended. It consists in the use of a large disk and a shot mark, the former to indicate the value only, the latter the location of the hit. The disk is exhibited at one side of the target so as not to interfere with the aim of the succeeding firer; the shot mark is attached to the target over the shot hole, and remains in view of the soldier while the succeeding firer is firing his shot. With this method of marking, a single target is preferable to the usual double target.

109. MARKING, RAPID FIRE.—In rapid fire with the rifle at the disappearing target the officer or noncommissioned officer in charge of the targets, at the signal from the firing point, commands "Ready." As soon as all is in readiness to run up the targets he commands "Up." Exactly twenty seconds after the targets are in position he commands "Down," having preceded this command two or three seconds by the warning command "Ready." The targets must be exposed and withdrawn as quickly as possible.

The number and value of the hits are signaled with the usual disks in the usual manner after the score has been fired, the

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number of misses being carefully indicated by the flag as a check on the accuracy of the number of hits signaled.

When the single-rolling Cushing target is used the method of marking will be varied to meet the conditions.

In rapid fire with the revolver at the disappearing target the manipulation of the target is as in rapid fire with the rifle, except that the target remains exposed ten seconds instead of twenty.

110. MARKING SKIRMISH FIRE.—In instruction practice, skirmish fire, as soon as the targets are withdrawn, the hits inside the frame are located and called. The target is then run up and the danger signal is displayed. The hits within the frame are then marked as follows: If within the figure, by placing the center of the white disk over the shot hole; if within the four space, by placing the center of the red disk over the shot hole; if within the frame outside the figure, and four space, by placing the center of the black disk over the shot hole. The target is then withdrawn, the danger signal taken down, and the shot holes pasted.

In record practice the hits will be scored and pasted but not marked, and in case the number of hits within the frame at any halt exceeds the number of shots fired at that halt, the target will be withdrawn for the remainder of that run.

CHAPTER III.

INSTRUCTIONS AND SUGGESTIONS.

The following instructions and suggestions apply where not in conflict with paragraph 95:

111. PRESERVATION OF ORDER.—The officer in command of the firing party, besides affording his men such instruction as they require, will be responsible that those waiting their turn to fire preserve order, and that all observe the general regulations of the range, and take such precautions as may be necessary to guard against accident.

112. WEATHER CONDITIONS.—While it is desirable that the soldier should be instructed in firing under varying conditions of weather, yet practice, particularly in the first weeks of the

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target season, should not be held on days when the conditions are so unfavorable as to render uncertain the causes of the errors that may be made.

113. PRACTICE HOURS.—Such an hour of the day will generally be selected for the regular practice as, considering the direction of the range with reference to the sun, the prevailing wind, etc., seems most favorable. An hour, however, will be chosen when the men are not fatigued from the performance of labor or from drill, and when sufficient time can be obtained for the deliberate completion of the firing before they are required for other duty. If this is not practicable, the practice will be continued at some other time and until all the men have fired.

Post commanders may so arrange the hours of attendance at target practice of the company musicians and cooks, the chief baker of the post, soldiers detailed as school-teachers, etc., as to enable them to follow the prescribed course with the least inconvenience to the command.

114. CALLING SHOTS.—As each shot is fired, the soldier will carefully notice the exact spot at which the rifle was aimed and announce, before the shot is signaled, where he believes it to have struck. If he correctly calls the shot it is probable that he has made the proper allowances, and no changes, except those in the elevation, which may be necessitated by the heating and fouling of the barrel, will be required. If, however, the soldier calls the shot incorrectly, he should determine what changes are required and make the proper corrections.

115. DIAGRAM TARGETS.—In instruction practice, if the men find it difficult to call the estimated location of their hit, a diagram of the target, drawn to a convenient scale, may be provided, on which the soldier can designate the point where he thinks his shot struck. By using two of these diagrams, one for each man of the pair firing, and pins with different colored heads, this method can be advantageously extended to graphically recording the estimated and true position of each shot of the score, thus exhibiting to the soldier, in the plainest manner, the nature of his errors. If on the diagram targets provided for each range the lines indicating necessary deflection and elevation, correction be drawn as in the "Target Range Pocket Book" (Ordnance Publication No. 1998), much time will be saved in giving necessary instruction in sight correction.

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116. DELIBERATION IN AIM.—In slow fire each soldier should endeavor to aim and fire with deliberation. If, when aiming, he feels unsteady and not confident of his shot, he should, without firing, lower his rifle and resume the aim after a moment's rest.

117. CORRECTING ERRORS.—The instructor should watch attentively the position of each soldier. He should, however, be careful not to check a man for any error when he is aiming, as it would probably have the effect of rendering him nervous and unsteady; but after the soldier has fired should inform him of his errors and caution him how to avoid them when firing the next shot. Serious damage is often done to the young soldier by undue harshness. After practice has begun, the instructor should carefully curb his temper, and refrain from hastily censuring or abusing the firer for some error, which in calm judgment would be found not to be a fault by intent or neglect, but due to lack of experience or knowledge.

118. FLINCHING AND THE CURE THEREFOR.—Flinching results from nervousness and may take several forms, of which the following are most common: Closing the eyes at discharge, a convulsive shrinking of the body from or toward the piece at the moment of discharge, thrusting the shoulder forward to meet the recoil of the piece.

This nervousness is often due to the instructor allowing the recruit to take a faulty position when first firing, as by placing the head too far forward, so that he receives a blow upon the face from his hand, by placing the butt of the piece against the collar bone or shoulder, or not pressing the piece firmly against the hollow of the shoulder so that the recoil causes pain.

To cure flinching, the faults of position, if any exist, should be eradicated. Every effort should be made to prevent the recruit from forming this habit and to eradicate it promptly when formed. The recruit should be taught to squeeze the trigger so gradually that he will not know when the firing pin is released. When firing upon the range the instructor may load the piece from a clip containing two or more dummy cartridges, being careful not to permit the soldier to note the position of the dummies in the magazine. The soldier should then be told that the magazine contains several dummies and be required to fire at the targets.

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119. ADVANCING THE SOLDIERS.—Although the men may have been properly grounded, the change of conditions from the gallery to the range will generally impair the success of the earlier firings, and will therefore make it necessary, whenever resuming range firing at the commencement of the practice season, to begin at the shortest range and, if necessary, to fire a few shots in the prone position. Many of the difficulties of range firing increase as the distance of the soldier from the target becomes greater.

120. SUSTAINING THE INTEREST.—In determining the proper method of conducting the further education of the soldier, the influence of his interest in his work (without which but little can be accomplished), of his ambition to attain a higher class in marksmanship, and of the natural emulation between the men should not be neglected. These are in reality the most potent factors, and by utilizing them as far as possible very great results can be accomplished and a high degree of efficiency attained.

121. LOW AIMING.—Experience shows that the invariable tendency of troops in battle is to aim too high, and that this tendency is greatly increased as proximity to the enemy is attained. To obtain the most useful effect from the soldier's fire in action, the habit of aiming low should be formed.

122. LONG-RANGE AIMING.—In the practice at long ranges the principal difficulties lie in the necessity for correctly estimating the force and direction of the wind and in allowing for these in adjusting the sight; also in the necessity for greater refinements in the estimate of the elevations required. It will therefore be necessary to study attentively these factors and to aim with even greater care than at the shorter ranges.

123. PRECAUTIONS AGAINST ACCIDENTS.—Great care will always be taken by the soldier, both in loading and in handling a loaded rifle, that all possibility of accident may be avoided. If the company has been marched to the target ground, before the command "Fall out" is given, the chambers will be opened and the magazines examined; if the company is not in ranks, each soldier will do this independently. The same precaution will be observed before passing from one firing point to another. The piece will not be loaded until the soldier has taken his position at the firing point and is ready to commence firing.

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The chamber will always be opened and the magazine emptied as soon as he has finished firing. The piece is always locked (turned to the "safe") when the firing is interrupted. One noncommissioned officer will be detailed in each firing party to see that the above instructions are complied with.

124. MISFIRES.—Cases of misfire of cartridges may be due to the fact that the bolt of the rifle was not entirely closed and the handle turned down to its extreme position when the trigger was squeezed. Attention is called to the necessity for pressing the bolt handle well to place before the trigger is squeezed, in order to avoid the chance of misfire.

125. TRIGGER SNAPPING.—After the soldier has adjusted the sight, and while he is waiting to be called to the firing point, he should (after taking precaution to see that his rifle is not loaded) take the position he proposes to assume in firing, and aim and squeeze the trigger several times. This will serve to steady him and also to accustom his eye to the light and its effect upon the sights.

126. DETAILS OF AIMING AND FIRING.—In slow fire, the estimated adjustment of the sight having been made and the soldier called to the firing point, he should take the position he generally adopts, load, examine again the adjustment of his sights, and then (noticing that he is looking at the proper target) aim carefully and steadily at the mark.

When firing prone, the stability of the position permitting great deliberation, the soldier, after the general direction of the piece has been given, should glance at any surrounding trees or high grass, and observe whether any sudden change has occurred in the direction and force of the wind. If any changes are noticed, the aim should be changed or discontinued and corrections made accordingly.

If no changes are deemed necessary the aim is completed and the piece fired, particular care being taken to observe the point of aim at the moment of discharge.

Immediately after firing the soldier should withdraw the bolt, especially if firing at the longer ranges, and observe at the same time whether the atmospheric conditions are still those for which the sight was adjusted. By this time the shot will have been signaled. If the correct allowances were made, practice can be continued without modification.

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If the hit is not placed as anticipated, the sight should be so adjusted as to correct the error.

To make this method of correcting for the succeeding shot of any value, the atmospheric conditions should remain unchanged, and, what is of great importance, the soldier's judgment of his aim at the moment of discharge should have been correct. The greater steadiness of the lying position will then give to this method its principal value at the mid and long ranges.

127. FINDING THE TARGET.—If a shot misses the target and no dust or other indication of the nature of the error is noticed, the direction of the miss must be inferred from the conditions of the weather. If a strong side wind is blowing, the miss is more than likely to be to either the right or left; if there is but little wind, if the day is either exceedingly dry or very damp, very bright or very dark, or if there is much mirage, or a strong wind in the direction of the plane of fire, the elevation assumed is probably incorrect.

In the first case, if the soldier from long firing has discovered the usual nature of his errors in estimating the deviating effect of the wind, he will be able to judge on which side of the target the miss was probably made. If this knowledge has not been obtained, it will generally be safer to assume that a sufficient allowance was not made, and that the shot passed the target on the side opposite to the wind. Windage should then be taken toward the wind a distance corresponding to three-fourths of the width of the target. If the direction of the error has been correctly judged, this will change on the next shot, if firing at short or mid ranges, a very close miss into a 4, well out on the opposite side of the target, or a miss of 1 or 2 feet into a 5 or 4 on the same side of the target. At long ranges a very close miss would be changed to a 3 on the opposite side of the target, misses of 1 or 2 feet to 4's or 5's. If firing at 600 yards, a miss of 4 feet, if at 1,000 yards one of 8 feet, would be brought on the target.

After correcting in this manner, if the target is not found on the second shot and the soldier is still convinced that his errors are horizontal rather than vertical, he was probably mistaken as to the side on which the misses were made. If, for instance, he has been taking windage to the right, it should now be taken to the left.

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If the target is again missed, make the correction in the direction first chosen, but with double the amount first selected. If still a miss, then apply this double correction in the opposite direction. If, after these different trials, no hit is obtained, abandon the theory of lateral errors and alter the elevations.

Whenever making changes in the elevation, after missing on the first shot, and there is nothing to indicate whether the shot was too high or too low, it is generally safer to assume the former to be the case, as a low shot will often raise a dust visible from the firing point, while a shot over the target might not.

If firing at 500 or 600 yards, when very great errors in the elevation are improbable, it should be decreased sufficiently to lower the second shot about half the height of the target; but if firing at 800 and 1,000 yards, the greater chances for error make it more advisable to change the elevation enough to produce a fall in the bullet equal to about three-fourths of the height of the target.

If on the second shot the target is not hit, increase the elevation above its first allowance as much as it was previously lowered. If a miss still results lower again, but to double the amount first selected, and if a hit is not yet made, increase the original elevation by this latter amount.

It will often be advisable to combine the horizontal and vertical methods of feeling for the target, alternating in successive shots the direction in which the allowances are made. The soldier must not temporize or make these corrections in a feeble manner; if unhesitatingly applied, and with their full value, the target will generally be quickly found; whereas if only slight changes are made, a number of shots, especially at the long ranges, may be fired without the nature of the error being discovered or a hit obtained.

128. KEEPING THE TARGET.—If the target is hit on the first shot and the allowances then made result in a 5 or close 4 for the second shot, the sights should not be changed during the remainder of the score; but the variations which may occur in the conditions affecting the elevations or wind allowances, unless they are very considerable, should be allowed for by altering the place on the target at which the rifle is aimed.

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This method, while generally advantageous, is especially so when firing in a puffy wind or in an alternately bright and dark light, as the fixed sight, a certain point of aim, and the conditions existing at the second shot, all form a valuable basis for comparison with the subsequent conditions.

When firing in a puffy wind, or in one subject to frequent changes in direction, the soldier should, as far as possible, endeavor to fire his shots under similar conditions, waiting a short period whenever necessary until they become the same as those in which previous shots were fired. If this can be done he will be able, without corrections in the sight, to hold on the mark throughout the score.

129. EFFECT OF TEMPERATURE.—After the proper adjustment of the sight and the point of aim have been determined upon, it will rarely happen while firing a single, or even several consecutive scores, that such changes can occur in the temperature as to make further corrections necessary. If the first shot has been fired from a clean, cool gun, the subsequent fouling and heating of the barrel and the different vibrations of the latter, which are caused by the heating, will generally make necessary a slight increase in elevation for the second shot, and often an additional increase for the third shot. This should be followed, in some cases where a number of shots are fired without cleaning or without any considerable interval, by a slight lowering of the elevation after additional shots.

130. EFFECT OF LIGHT.—The effect of clouds or bright sunshine is mainly noticed in the elevations. On bright, hot days, there is greater probability of local currents, produced by the differently heated areas of ground, which, unless the soldier is thoroughly familiar with the topography of the range, will cause unaccountable deflections. On these days also there is a possibility of portions of the range being in shade; that particular ground will therefore be cooler, and consequently the adjacent air (being of a greater density) will offer increased resistance to the bullet. Under these conditions there is greater probability of inaccurate shooting.

When the day is overcast, the light being of a dull gray and evenly diffused, it is more likely that the air over the whole range will be of a uniform temperature and free from local

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eddies. Such weather is the most favorable for accurate practice.

When the light is alternately bright and then shaded by clouds, the difficulties confronting the soldier are much increased. These changes of light, besides affecting the conditions which cause a deflection of the bullet, also have a considerable influence upon the aim.

131. CHANGING LIGHTS.—Changes in the brightness of the light seem to affect the aiming of different soldiers in various ways. Suggestions which would prove of value in many cases might therefore prove erroneous in others. It is, however, generally found, if shooting on a cloudy day and the sun appears and lights up the target, that the elevation should be diminished, while if shooting on a bright day and the sun becomes obscured the elevation should be increased.

In cases where the light is frequently changing it is essential that the soldier should prolong his aim until his eyes become accustomed to the altered conditions and until he becomes assured that his observation is correct.

132. MIRAGE.—When shooting on hot, cloudless days, especially if over low, level ground, or over ground not covered with grass, the target will appear to be raised higher than it really is, the bull's-eye to be elongated vertically, and its outlines and those of the target to have a wavy and ill-defined appearance.

This mirage is more noticeable as the firer is closer to the ground; it will then be more frequently observed by the soldier when firing lying down than when firing either kneeling or standing. As the true position of the target is below the apparent, the elevation should, if the mirage is considerable, be decreased.

This can be illustrated and the extent of its effect determined if, early in the morning, before the mirage is noticeable, a telescope is directed at the target and so adjusted that the two lower corners of the target just touch the lower arc of the circumference of the field of view; the telescope should then be clamped in position. Later in the day, before commencing firing, examine the position of the target in the field of view; if there is much mirage, the target will appear considerably raised, and in some cases also laterally displaced; the extent of this apparent movement will be shown by comparing the

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second with the first position of the target, and should be measured by the eye, using the entire target or the bull's-eye as a unit of measure; the elevations which would otherwise be selected by the soldier should then be decreased by the amounts corresponding to these displacements.

133. CONDITIONS MOST FAVORABLE.—When all the influences affecting the elevations and the accuracy of fire are considered, it follows that the best results will generally be obtained on warm, damp days, with the sky uniformly overcast, and that on these days less elevations and smaller changes will be required. The reverse of these effects obtains on a hot, bright day.

134. CHANGING SIGHTS.—With very many soldiers, even the most expert shots, some slight motion of the piece takes place between the time when they intended to squeeze the trigger and the instant when the object is accomplished. If the soldier does not notice this motion, he ascribes to extraneous influences his error, and corrects accordingly, whereas it was in reality, the holding that was in fault, and perhaps the adjustment of the sights and selection of the point of aim were correctly made. For this reason it is often inadvisable to change the sights if a single shot goes wild, especially if the preceding shots were good.

135. VALUE OF AVERAGE PROFICIENCY.—It may be recognized as an established fact that any body of men, where all have received careful instruction and have reached a fair state of proficiency in the use of their weapons, will be of more value upon the battle field than if a few of their number had become even more expert, but the instruction of the remainder neglected in order to reach this result.

It is therefore incumbent upon the company commander to endeavor to make good average shots of all his men, devoting even more time to the poor than to the expert shot.

In instructing the soldier, the company commander should appeal to his common sense, explaining in detail and showing him in all cases the reasons for the methods he prescribed. The individual intelligence of the soldier will thus be brought into play, and his value in the dispersed order of fighting which is made necessary to such a great extent by the power of the present small arm will be greatly increased.

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CHAPTER IV.

MARKSMAN'S COURSE; SHARPSHOOTER'S COURSE; EXPERT RIFLEMAN'S TEST.

GENERAL REMARKS.

136. TABULATION.—For convenience of reference, a part of the general scheme set forth in paragraph 81 is here tabulated in detail.

The tables are three in number, and relate to the three divisions of the subject, viz, marksman's course, sharpshooter's course, and expert rifleman's test. Each table is followed by regulations, partly in explanation of and partly in addition to the table. It will always be understood that the tables have the force of written regulations.

137. MARKSMAN'S COURSE.

Slow fire.

Ranges (yards).	Instruction practice.			Record practice.		
	Time limit.	Scores.	Positions.	Time limit.	Scores.	Positions.
200	No limit.	Minimum of two at each range.	Standing.	A maximum of 1 minute per shot, time to be computed from full appearance of the target to the discharge of the piece.	2	Standing.
300			Kneeling and sitting.		2	Choice of kneeling or sitting.
500			Prone.		{2 s. s. 2}	Prone.
600			Prone.		{2 s. s. 2}	Prone.

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RAPID FIRE.

Battle sight only will be used.

Ranges (yards).	Instruction practice.			Record practice.		
	Time limit.	Scores.	Positions.	Time limit.	Scores.	Positions.
200	20 seconds for each score.	Minimum of two at each range.	Kneeling.	20 seconds for each score.	2	Kneeling.
300			Kneeling and sitting.		2	Choice of kneeling or sitting.

Skirmish fire.

Ranges (yards).	Instruction practice.				Record of practice.			
	Time limit.	Shots.	Positions.	Runs.	Time limit.	Shots.	Positions.	Runs.
600	30 seconds.	2	Choice of prone, kneeling, or sitting.	Minimum of two.	30 seconds.	2	Choice of prone, kneeling, or sitting.	Two.
500	30 seconds.	2			30 seconds.	2		
400	30 seconds.	3			30 seconds.	3		
350	30 seconds.	3			30 seconds.	3		
300	30 seconds.	5			30 seconds.	5		
200	20 seconds.	5			20 seconds.	5		

Slow fire.

138. TARGETS.—"A" at 200 and 300 yards; "B" at 500 and 600 yards. (See "Targets," Part VI, Chap. I.)

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SIGHT.—The battle sight will be used for one score instruction practice at each of the ranges 200, 300, and 500 yards.

SIGHTING SHOTS.—Two required to precede the first score at 500 and 600 yards, record practice. No others are permitted except when the scores at either range are fired on different days. (See par. 97.)

POSITIONS.—Careful attention will be given to instruction in both kneeling and sitting positions at 300 yards, instruction practice; but choice of these two positions will be permitted in record practice. In the position kneeling, the variations authorized in paragraph 40 only, will be permitted.

Rapid fire.

139. TARGET.—"D" at both ranges. (See "Targets," Part VI, Chap. I.)

PROCEDURE.—At 200 yards: The magazine is filled, the piece loaded with one cartridge therefrom, and held at the ready, standing. For infantry and coast artillery the bayonet will be fixed. At a signal from the firing point (trumpet, whistle, or telephone) the target appears, remains in sight twenty seconds, and then disappears. The soldier, without coming to the order, takes the kneeling position (see Positions, par. 138) as soon as any part of the target appears, and attempts to fire five shots, emptying the magazine and firing at will without command, until the target has completely disappeared. In case of a defective cartridge or disabled piece the practice is repeated. Time is regulated at the target, the signal from the firing point being given as a warning to the officer or noncommissioned officer in the pit in charge of the target that all is ready at the firing point for the target to appear. For the method of marking and manipulating see paragraph 109. At 300 yards the procedure is the same except that the soldier assumes the position chosen before the appearance of the target and the bayonet is not fixed.

Skirmish fire.

140. TARGET.—Target "D." (See "Targets," Part VI, Chap. I.) One target for each skirmisher.

MANIPULATION OF TARGETS.—Targets are mounted on disappearing carriages and the prescribed detail for marking and

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scoring remain in the pit. The officer or noncommissioned officer in charge will be provided with a stop watch. At a signal from the firing point (by telephone or trumpet) that the squad is ready for the advance, the officer or noncommissioned officer in charge of the pit causes the danger signals to be lowered and thirty seconds after receiving the signal "Ready," runs up the targets. The targets remain up thirty seconds and are lowered at the command of the officer or noncommissioned officer in charge of the pit. Hits are marked, scored, and signaled (in instruction practice) as prescribed in paragraph 110. One minute from the time the targets are lowered they are again run up and remain up thirty seconds as before. This method of procedure is followed for the entire run except that between the third and fourth, and fourth and fifth halts, but forty-five seconds intervenes between the lowering and raising of the target, and on the sixth halt the target remains up but twenty seconds.

CONDUCTING THE SKIRMISH LINE.—The skirmishers, having been assigned to targets, are formed a short distance in rear of the 600-yard firing point, each man opposite the target to which assigned. The magazines are filled, one cartridge loaded therefrom, and the safety lock turned to the safe. In skirmishing, the magazine will always be filled from a full clip. Notification is then sent to the pit by telephone or trumpet that the squad is ready for the advance. The line is advanced to 600 yards and halted. The necessary commands for firing two rounds at the targets are then given. As soon as any portion of the target appears the soldier commences firing and continues firing while any portion of the target remains in sight or until he has fired the prescribed number of rounds. As the targets disappear the officer in command of the skirmish line commands or signals "cease firing." In instruction practice the targets are then run up, marked, and again lowered. The advance is then resumed. In record practice the advance is resumed immediately after "cease firing," and the targets are not marked.

The squad is halted at 500 yards from the targets, where two rounds are fired in the same manner as at 600 yards. The advance then continues in the same manner to the 400 and 350 yard firing points, at each of which three rounds are similarly fired, and then to 300 and 200 yards, at each of which five rounds

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are similarly fired. The halt at 400 yards finds the soldier with but one cartridge in his piece. As soon as this is fired, the piece is reloaded and the remaining two prescribed shots are fired without further command. Commands in all cases conform to the Infantry Drill Regulations.

The advance between 600 and 200 yards will be between any two successive halts, first half in quick and second half in double time; it is enjoined upon all instructors to see that the double time is maintained as nearly as possible according to Infantry Drill Regulations. The firing is completed at 200 yards.

At all ranges except 600 yards the battle sight only will be used.

For each shot fired by the soldier before the appearance of the target or for each shot fired in excess of the number ordered at each halt 5 points will be deducted from his score. Five points will be deducted for the failure to fire the number prescribed for the halt before the disappearance of the target, except that if the failure is due to a misfire no penalty will be imposed. The defective cartridge will be replaced by the soldier, but the substituted cartridge must be fired, if at all, at the halt where the misfire occurred and while the target is in view. The defective cartridge must be turned in before the advance is resumed to a file closer, who will replace it with another. A piece disabled through no fault of the firer entitles him to another run. In case the number of hits on any target exceeds the number of shots fired at that particular halt, or in case of a jammed piece at any range, the soldier will do no more firing during that run, but will be required to repeat the run and begin his firing at the range where the target was withdrawn or the piece became jammed. A penalty having been imposed will stand against the firer's score, although he be required to repeat the run. As in instruction practice the location of all hits within the frame is indicated to the soldier at each halt, the soldier will not be permitted to approach the targets, which upon the completion of the run will be made ready for the succeeding run. In skirmish fire a particular run will always be for instruction practice, or for record practice, exclusively; men engaged in both instruction and record practice never running at the same time.

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141. SHARPSHOOTER'S COURSE.

Slow fire.

Ranges (yards).	Instruction practice.			Record practice.		
	Time limit.	Scores.	Position.	Time limit.	Scores.	Position.
800	No limit.	Minimum of two at each range.	Prone.	A maximum of 1 minute per shot, time to be computed from full appearance of target to discharge of piece.	2 s. s. 2	Prone.
1,000			Prone.		3 s. s. 2	Prone.

RAPID FIRE.

Battle sight only will be used.

Range (yards).	Instruction practice.			Record practice.		
	Time limit.	Scores.	Position.	Time limit.	Scores.	Position.
500	30 seconds for each score.	Minimum of two.	Prone.	30 seconds for each score.	2	Prone.

TARGETS.—"C" slow fire and "D" in rapid fire. (See "Targets," Part VI, Chap. I.)

SIGHTING SHOTS.—Two required to precede the first score at 800 yards and three at 1,000 yards, record practice. No others

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permitted except when the scores at either range are fired on different days. (See par. 97.)

142. The sharpshooter's course having been completed, all soldiers will then fire the instruction course, field practice. (Part IV, Chap. IV.) This course completed, all who have qualified as sharpshooters will take the expert rifleman's test.

143. *Expert rifleman's test.*

Ranges.	Position.	Target.[a]	Shots.	Time limit.	Required for qualification.
600	Prone, with rest for rifle.	E	10	Moving target, to travel 50 yards in 30 seconds and be exposed for 30 seconds only.	A total of 25 points.
500	Prone.	5G	10		
500	Prone.	H figure E.	5	Bobbing targets, to be exposed 5 seconds; 5 seconds interval between exposures.	
400	Prone.	H figure E.	5		
300	Prone.	M	10		
200	Kneeling.	M	10		

[a] For targets see Chapter I, Part VI.

In this test each hit on any target counts one (1). At 500 yards and all shorter ranges the battle sight will be used. When firing at the moving targets with the battle sight the windage will be set at zero.

The firing from 600 yards will be from the skirmisher's trench (see fig. 3, p. 359, Engineer Field Manual, 1907) on the parapet of which the rifle will be rested. Targets E will be placed 5 yards apart on the exterior crest of a parapet, at least 12 inches high, 600 yards distant. Each soldier will be assigned a target, and at the command "commence firing" will aim and fire, reload his magazine, and continue firing until he has fired 10 shots, slow fire. The hits will be indicated and the score entered as soon as the 10 rounds per man have been fired. In case a target falls during the firing or there are more than 10 hits on any target the practice for that individual will be repeated.

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In firing at the falling (G) targets, the soldier will be in position (see par. 123, "Infantry Drill Regulations") with rifle at the "Ready." The targets are placed in line 5 yards apart and are carefully set. At the command "Commence firing" the soldier opens fire and endeavors to fire 5 shots. The targets disappear when struck. After an interval of thirty seconds the command "Cease firing" is given. For each shot fired before the command "Commence firing" or after the command "Cease firing," one point will be deducted from the soldier's total score. The practice is repeated for each soldier. In case a target falls through accident, and not as the result of a shot fired by the soldier, the score will be repeated.

In firing at the bobbing targets, the soldier being in the prone position, as above, with the piece at the ready, a signal is given from the firing point and one bobbing target appears and remains in sight five seconds; the soldier fires one shot and may retain his piece at the shoulder if so desired; five seconds after the disappearance of the first target, the second target will appear, and so on. In this class of fire, but one man will fire at a time. In order that the soldier may not know where to expect the second or subsequent target to appear, the targets will not be displayed in regular sequence. The result will be indicated and the score entered after each five shots.

In firing at the moving targets the soldier will take the required position with the piece at the "Ready." The target will first be moved from right to left, and after the shots are marked and scored then from left to right. The soldier opens fire as soon as any portion of the target appears and continues firing until the target disappears or he has fired 5 shots.

In order to insure impartial conditions to all participants this test will be conducted by an officer and under the personal supervision of a field officer or the post commander, and with all the particularity of the regulations governing competitions.

Special tests may be held at any time under the supervision of an officer detailed for the purpose (a field officer if practicable) in case of eligible men about to be discharged or otherwise deprived of the opportunity of attempting to qualify as expert riflemen.

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CHAPTER V.

SPECIAL COURSES.

144. PRELIMINARY DRILLS.—All special courses will be preceded by the prescribed preliminary instruction and drills for the rifle.

SPECIAL COURSE A.

145. WHEN USED.—When a complete range is not available, and a range of 200 and 300 yards can be had, practice may be conducted, if authorized by the department commander, as prescribed in the following special course A. This course is also prescribed for the troops of the Coast Artillery. The same special course may be followed for the supplementary firing at posts where, due to unfavorable conditions, the regular instruction practice can not be duly carried out.

Slow fire.

Ranges (yards).	Instruction practice.			Record practice.		
	Positions.	Time limit.	Scores.	Positions.	Time limit.	Scores.
200	Standing.	No limit.	Minimum of two scores at each range.	Standing.	A maximum of 1 minute per shot, time to be computed from full appearance of target to the discharge of the piece.	2
300	Kneeling and sitting.			Choice of kneeling or sitting.		2
300	Prone.			Prone.		2

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RAPID FIRE.

Battle sight only will be used.

Ranges (yards).	Instruction practice.			Record practice.		
	Positions.	Time limit.	Scores.	Positions.	Time limit.	Scores.
200	Kneeling.	20 seconds for each score.	Minimum of 2 scores at each range.	Kneeling.	20 seconds for each score.	2
300	Kneeling and sitting.			Choice of kneeling, or sitting.		2
300	Prone.			Prone.		2

Subject to the conditions noted in the table, the course will be pursued in accordance with regulations governing slow and rapid fire, marksman's course. (For qualifications see par. 347.)

SPECIAL COURSE B.

146. WHEN USED.—For posts where a range of 200 and 300 yards can not be obtained and special course A can not be followed, practice may, if authorized by the department commander, be as prescribed in the following special course B:

147. *Slow fire.*

Instruction practice.						Record practice.		
Ranges (real), feet.	Ranges (simulated), yards.	Targets.	Positions.	Time limit.	Scores.	Positions.	Time limit.	Scores.
50	200	Y	Standing.	No limit.	Minimum of 2 scores at each range.	Standing.	A maximum of 1 minute per shot, time to be computed from full appearance of target to the discharge of the piece.	2
50	300	Z	Kneeling and sitting.			Choice of kneeling or sitting.		2
50	300	Z	Prone.			Prone.		2

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Rapid-fire.

Instruction practice.						Record practice.		
Ranges (real) feet.	Ranges (simulated) yards.	Targets.	Positions.	Time limit.	Scores.	Positions.	Time limit.	Scores.
50	200	Y	Standing.	20 seconds for each score.	Minimum of 2 scores at each range.	Standing.	20 seconds for each score.	2
50	300	Z	Kneeling and sitting.			Choice of kneeling or sitting.		2
50	300	Z	Prone.			Prone.		2

FIRING AT MINIATURE TARGETS—SERVICE CHARGES.

148. Course B is of special utility in time of war, when the course of target practice laid down in this manual is not practicable for the instruction of recruits, for the reason that ranges with proper facilities are often lacking and time is short.

A range of 50 feet enables the firer to see the hole made by the shot, and saves the time ordinarily taken in indicating the position of the hit.

DESCRIPTION OF SYSTEM.

149. RANGE.—The range is 50 feet.

150. TARGETS.—The division of miniature targets X, Y, and Z (see "Targets," Chap. I, Part VI) are, respectively, one-sixth, one-twelfth, and one-eighteenth of the size of the divisions on the A target, and subtend the same visual angle as do those of the A target when at 100, 200, and 300 yards.

151. COURSE.—The course is the same as special course A, using miniature target Y for 200 yards, and target Z for 300

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yards firing. It is preceded, when there is no gallery range, by such firing at target X as may be necessary.

152. FRONT SIGHT.—For firing at miniature targets a special front sight is provided by the Ordnance Department, which slips over the service sight, obviating the necessity which would otherwise exist of aiming below the bull's-eye.

153. BACK STOP.—A back stop 10 feet high is, in point of safety, when firing at 50 feet, equivalent to a back stop of 60 feet at a distance of 100 yards and 120 feet at a distance of 200 yards. It is generally possible to find in the vicinity of the post or camp a perpendicular cut bank having a height of 10 feet or more. In case such a bank can not be found a suitable back stop will be constructed. Nine inches of sand or 18 inches of loam will be sufficient to stop the bullet.

154. METHOD OF FIRING.—An instructed man is detailed to coach each recruit. The squad of recruits is drawn up facing the targets. At the command or signal "commence firing" the recruits, under supervision of the expert shots detailed as coaches, fire slowly until 10 cartridges have been fired. The coach, standing by the recruit, corrects his fault of position or trigger squeezing, points out the position of each shot, and in each case explains the cause of the miss. When 10 shots are fired the miniature targets are removed to serve as records, and replaced by new targets, when the firing, if necessary, recommences. The disappearing target is not used in rapid fire in this course. In the rapid fire each man takes the required position in front of the target assigned to him with his piece at the "ready." At the command or signal "commence firing," he opens fire and endeavors to fire 5 shots. The command or signal "cease firing" is given twenty seconds after the command "commence firing," when all firing ceases.

155. NUMBER OF MEN SHOOTING.—From 1 to 100 men may fire at the same time, this depending on the number of coaches and the extent of the back stop. With 30 men shooting at the same time, 1,000 men may finish the course of firing in eighty hours. This course will be pursued for the hasty instruction of volunteers and recruits in time of war, when, owing to the lack of time, range firing is impracticable.

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SPECIAL COURSE C.

156. WHEN USED.—This course is prescribed for the use of the organized militia of the United States, as far as conditions permit, and will be preceded by the preliminary instruction and drills prescribed in Part II, using the methods and rules prescribed in this manual, as far as they are applicable. Proficiency in estimating distances will not be requisite for qualification. If facilities are available and the allowance of ammunition permits, such field practice of the nature of that prescribed in Part IV herein, as the state authorities may prescribe, may be held and a proficiency test adopted, if desired.

157. RULES.—The rules governing known distance practice for the rifle are set forth in the following tables and regulations:

Conditions and record of rifle firing in special course "C" required for qualification in the grades set forth below.

Marksman's record course.

Class of fire.	Ranges (yards).	Time limit.	Best scores not necessarily consecutive.	Positions.	Possible totals.
Slow fire.	200	(*)	2	Standing.	50
	300		2	Choice of kneeling or sitting.	50
	500		2	Prone.	50
	Total				150

Aggregates required to qualify in grades set forth below.

3d-class man.	2d-class man.	1st-class man.	Marksman.
All who make 45 in marksman's record course.	67	83	98

Sharpshooter's record course.

Class of fire.	Ranges (yards).	Time limit.	Best scores not necessarily consecutive.	Positions.	Best run.	Possible totals.
Slow fire.	600	(*)	2	Prone ...	....	50
Rapid fire.	200	20 secs. for each score.	2	Kneeling.	....	50
Skirmish fire.			Shots.	Choice of prone, kneeling, or sitting.	One.	100
	600	30 seconds.	2			
	500	30 seconds.	2			
	400	30 seconds.	3			
	350	30 seconds.	3			
	300	30 seconds.	5			
	200	20 seconds.	5			
	Total					200

Aggregates required to qualify as sharpshooter.

Sharpshooter.
120 in marksman's record course, and 40 at 600 yards, slow fire, and 235 in marksman's and sharpshooter's record courses together.

Expert rifleman's course.

Class of fire.	Ranges (yards).	Time limit.	Best scores not necessarily consecutive.	Position.	Possible totals.
Slow fire.	800	None.	2	Prone.	50
	1000	None.	2		50
	Total				100

Aggregates required to qualify as expert rifleman.

Expert rifleman.
Aggregates necessary for sharpshooter and 40 at 800 yards, and 35 at 1000 yards.

* Max. of 1 min. per shot, time to be computed from full appearance of target to discharge of piece.

NOTE.—Fourth-class men are all who have not fired or who have fired and failed to qualify as third class or better.

CLASSIFICATION FOR SPECIAL COURSE C.

158. The class in firing to which any officer or soldier belongs will be determined at the end of the practice season from the aggregate of the total of the best two full scores of 5 shots each (not necessarily consecutive) that he has made on the range, as follows:

Fourth class.....All who have not fired or who have fired and failed to qualify as third class or better.

Third class.....All who have fired two or more full scores at 200, 300, and 500 yards, and from the best two have made an aggregate of 45 out of a possible 150.

Second class.....All who have fired two or more scores at 200, 300, and 500 yards, and from the best two have made a total of 67 out of a possible 150.

First class.....All who have fired two or more full scores at 200, 300, and 500 yards, and from the best two have made a total of 83 out of a possible 150.

Marksmen.....All who have fired two or more full scores at 200, 300, and 500 yards, and from the best two have made a total of 98 out of a possible 150.

Sharpshooters.....All who have fired two or more full scores at 200, 300, and 500 yards, and from the best two scores at each range have made a total of at least 120; and have further fired two or more full scores at 600 yards, and from the best two scores at that range have made a total of at least 40; and have fired two or more full scores, rapid fire, at 200 yards (twenty seconds allowed for firing each score), and in the best two have made a total of 25; and have made one skirmish run of 20 shots, advancing from 600 to 200 yards; the total of all scores being not less than 235.

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Experts.....All who have made the necessary total to qualify as sharpshooter and have fired two or more full scores at 800 and 1,000 yards, and from the best scores have made a total of 40 at 800 and 35 at 1,000 yards.

GENERAL REGULATIONS GOVERNING SMALL-ARMS FIRING BY THE ORGANIZED MILITIA OF THE UNITED STATES.

159. FIRING.—In slow fire, rapid fire, and skirmish fire, the rules laid down in the regular army course will be followed as far as applicable.

160. ALLOWANCE OF AMMUNITION.—The allowance will be fixed by the State.

161. GENERAL REGULATIONS.—The regulations as to range officers, pit regulations, and scoring to be the same as in the Regular Army. Target year will be from January 1, to December 31. The months constituting the regular practice season for any State will be designated by the proper state authorities thereof. There will be no supplementary practice season.

162. REPORTS.—From each State a report of target firing will be forwarded to the chief of the Division of Militia Affairs, War Department, as soon after the close of the practice season as practicable.

163. SPECIAL COURSES "A" AND "B."—The methods pursued in these courses will be utilized, as far as applicable, when longer ranges are not available. No regular classification into marksmen, sharpshooters, etc., is possible under these courses, but a special classification of marksmen in special course "A" is provided in paragraph 347.

164. INSIGNIA.—These will be of bronze and will be uniform in general appearance for the different classes of marksmen in the several States, and will be supplied by the Chief of Ordnance of the Army upon requisitions of the governors of the several States and Territories and of the commanding general of the National Guard of the District of Columbia, as purchases for cash under the provisions of section 17 of the act of January 21, 1903.

165. FIGURE OF MERIT.—In each State there will be a company, battalion, and regimental figure of merit to be calculated

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by the methods laid down by the state authorities; or a proficiency test, similar to that prescribed for the Regular Army in paragraphs 351 to 355, inclusive, herein, may be devised by the state authorities and applied by the inspector of small-arms practice of such State, or by officers specially designated by the state authorities.

166. COMPETITIONS.—There will be two classes of competitions, state and national. State competitions, if practicable, will be held annually. The national competition, which will be held each year, will be at such place as shall be designated by the Secretary of War. The state teams visiting the national competition may, under section 14 of the act of January 21, 1903, receive pay, subsistence, and transportation from the appropriation for the support of the organized militia. The results of the national competition will be published by the War Department.

167. RULES AND REGULATIONS FOR COMPETITIONS.—These, as far as practicable, will be the rules prescribed for the departmental and army competitions of the Regular Army.

168. MEDALS.—The medals for competitions in the State will be prescribed by the state authorities. The medals for the national competition will be prescribed by the Secretary of War.

169. REVOLVER COURSE.—Divided into three classes, viz: marksman, sharpshooter, expert. Target "A" (8-inch bull's-eye).

COURSE FOR QUALIFICATION AS MARKSMAN AND AS SHARPSHOOTER.

(Distances: 15, 25, and 50 yards.)

15 yards: 2 scores, rapid fire, ten seconds to each score of 5 shots.

25 yards: 2 scores, rapid fire, ten seconds to each score of 5 shots.

25 yards: 2 scores, timed fire, thirty seconds to each score of 5 shots.

50 yards: 2 scores, slow fire, one minute to each shot; 5 shots to each score.

Necessary for qualification as marksman: Sixty-five per cent of possible score, or 130 out of 200 points. Necessary for qualification as sharpshooter: Eighty per cent of possible score, or 160 out of 200 points.

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COURSE FOR QUALIFICATION AS EXPERT (OPEN TO SHARPSHOOTERS ONLY).

(Distances: 15, 25, 50, and 75 yards.)

15 yards: 2 scores, rapid fire, eight seconds to each score of 5 shots.

25 yards: 2 scores, rapid fire, eight seconds to each score of 5 shots.

25 yards: 2 scores, timed fire, twenty seconds to each score of 5 shots.

50 yards: 2 scores, timed fire, twenty seconds to each score of 5 shots.

75 yards; 2 scores, slow fire, twenty seconds to each shot; 5 shots to each score.

Necessary for qualification as expert: Eighty per cent of possible score, or 200 out of 250 points.

Those who qualify in the course will be designated as "Revolver marksmen," "Revolver sharpshooters," and "Revolver experts;" and will be entitled to wear insignia indicating the qualification attained, as follows: For a marksman, a pin bearing the inscription "Revolver marksman;" for a sharpshooter, a badge consisting of a cross pendant from a pin bearing the inscription "Revolver sharpshooter;" for an expert, a badge consisting of two revolvers crossed superimposed upon a laurel wreath, the whole suspended from a pin, bearing the inscription "Revolver expert." These insignia will be of bronze metal.

For each three years of qualification in any one of the grades of revolver marksmanship a bronze bar will be issued specifying the years of qualification, and will be attached to the lower edge of the pin.

The insignia and bars prescribed in the preceding paragraphs will be supplied by the Chief of Ordnance of the Army upon requisitions of the governors of the several States and Territories and commanding general of the National Guard of the District of Columbia, as purchases for cash under the provisions of section 17 of the act of January 21, 1903.

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PART IV.

FIELD PRACTICE.

170. GENERAL SCHEME.—By means of field firing with suitable targets conditions which exist in war may be simulated to a certain degree, and officers and men may become familiar with situations which will arise in action and learn how they should be met.

It is not possible to prescribe an exact system of field firing which will suit every locality and circumstance of station. It is intended to leave much to the initiative and ingenuity of officers. The post commander will be held responsible for the efficiency of his command in field practice and that the proper facilities for carrying out this class of practice are furnished.

The following general rules will govern:

(*a*) Field practice will follow known distance practice.

(*b*) All who are required to fire in known distance practice will fire in field practice.

(*c*) Officers who fire and enlisted men authorized but not required to fire will take the instruction practice only.

(*d*) All field practice will be held in the field kit as prescribed for the arm of the serice.

Field practice will be subdivided into preliminary training and instruction practice, and regular practice.

Regular practice will be subdivided into individual practice and collective practice.

As a knowledge of the effects of fire, the influence of ground in relation thereto, and of the principles which govern in the employment of fire in action, are essential to those charged with fire direction and fire control, a chapter on each is, for convenience of reference, inserted here.

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CHAPTER I.

EFFECT OF FIRE.

171. RANGE AND TIME OF FLIGHT.—The maximum range computed for the United States magazine rifle, model 1903, with model 1906 ammunition, is 5,465 yards, angle of elevation 45°, and time of flight 31.36 seconds. For the rifle, the bullet is overtaken by the sound of discharge at about 2,050 yards.

172. DANGER SPACE.—(See Definitions.) The trajectory cuts the line of sight in two places, the first near the muzzle, the second at the point aimed at (supposing that point to be struck); between these two points all portions of the trajectory are above the line of sight. The height of the trajectory above the line of sight at any given point is called the ordinate of the trajectory at that point. The ordinates of trajectories for different ranges above the corresponding lines of sight are given, for the rifle, in tables furnished by the Ordnance Department.

Since aim is always taken at the lowest visible point of the object, it follows that for that portion of the trajectory where the ordinates are equal to, or less than, the height of the object aimed at, the danger space is continuous. The majority of misses in field practice and in service result from an erroneous estimate of the range. If, however, the estimate be not too small, and sufficiently accurate to bring the object within the danger space of the rifle, the object will be struck. When other conditions are the same, the danger space will be greater for a given object, for fire from a prone than from a standing position. It will be greater when the object is a soldier standing than for one kneeling or prone, and greater still when the object is a mounted man. Owing to the fact that the curvature toward the earth of the trajectory is continually increasing, the angle of fall for longer ranges is greater than for ranges not so long. Consequently the danger space, or the part of it that is considered in practice, for an object of a given height, grows less as the range increases, and renders it more important that the range should be more accurately known in order to hit the object. But this same increase of distance renders it more difficult to obtain a close estimate of the range, and it is largely the combination of these two circumstances that renders execution with long-range fire so difficult to attain.

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173. CONE OF DISPERSION.—In consequence of the variations in the different parts of the rifle, imperfections in the ammunition, and individual causes of error, a series of shots fired by a soldier at a mark under uniform meteorological conditions will not all follow the same path, but will be more or less separated. The collection of hits thus made on a target forms a diagram which may be termed the "shot group," the dimensions of which vary mainly with the skill of the firer. The mean central point of this group is called the "center of impact." If the average mean individual error horizontally and vertically be determined by experiment, data is obtained from which may be indicated the distances up to which individual fire may be expected to be effective at targets of a given size.

If the size of the shot group of an individual is equal to or less than an object at any range, his fire at that object should always be effective at that range. When the shot group is spread over a larger surface than the object, his shots must necessarily miss the latter in proportion as the size of the shot group exceeds that of the object.

The mean horizontal and vertical deviations for the service rifle for ranges from 100 to 2,000 yards, inclusive, have been determined by the Ordnance Department and are published in "Descriptions and Rules for Management of the United States Magazine Rifle."

The causes which make for dispersion of shots in this table are dependent upon variations in different parts of the rifle and imperfections in the ammunition alone.

Individual errors, a very important influence, do not enter as a factor.

The trajectories of all the shots of the group considered together constitute the "Cone of dispersion."

If a series of shots be fired at a given mark by a body of soldiers, the causes which make for a dispersion of shots in the case of an individual will be multiplied and the cone of dispersion will be much larger.

174. BEATEN ZONE.—In collective fire the figure formed by the intersection of the cone of dispersion with the surface of the ground on which the objective stands is called the "beaten zone."

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If shots be fired at an objective by a body of men and the strike of the bullets on a horizontal surface be plotted, it will be found that the majority of bullets fall in the general direction of the line of fire, that the density of the grouping decreases progressing from the center to the extreme limits of the beaten zone. The area around which the majority of hits occurs is called the "central zone," and, for purposes of comparison, is considered to include the best 50 per cent of the shots. The

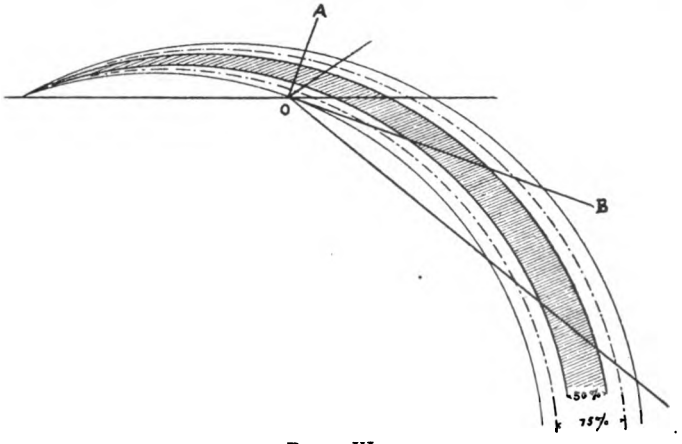

PLATE VI.

area swept by the best 75 per cent of the shots is termed the "zone of effective fire." It has been found by experiment that useful results can only be looked for when the target is within this limit. (See Plate 6.)

Up to 700 yards the area of the beaten zone need not be considered, as, owing to the flatness of the trajectory, the whole extent of ground from the firers to the target is swept by bullets.

Beyond this range, owing to the fact that the surface of the ground is generally at an acute angle to the axis of the cone of dispersion, the beaten zone assumes an elliptical form, with the

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longer axis in the direction of the line of fire. But as the range increases and the angle of fall becomes greater, this intersection assumes more nearly a circular form. This tendency to assume a circular form is increased by reason of the fact that errors in elevation at the shorter ranges increase the length of flight of the bullet, and consequently the depth of the danger zone, much more than the same errors would increase this depth at longer ranges, while errors made laterally increase directly as the range increases.

Notwithstanding that at the longer ranges the area of the beaten zone is diminished, fire is less effective than at short distances, owing to the greater curve of the trajectory.

CHAPTER II.

INFLUENCE OF GROUND.

175. DEFILADE.—An obstacle of sufficient thickness to prevent the penetration of the bullet will protect from fire the space extending from its foot to the point where the bullet, which grazes its crest, meets the ground. The space which is thus protected from fire is called "defiladed space." Its extent will

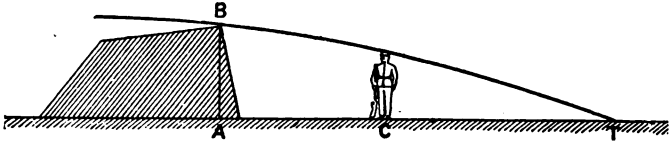

PLATE VII.

depend on the height of the shelter, the curvature of the trajectory and the slope of the ground behind the shelter.

In Plate 7 the distance A–T will represent the defilade space for the trajectory B–T and an obstacle the height of A–B. A soldier beyond T would be struck by bullets passing a slight

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distance over the crest B; he would be partially sheltered between T and C (the danger space for this trajectory); and would be completely protected throughout the distance A–C.

If the height of the shelter be less than that of a man standing, only a partial protection will be afforded, and complete shelter can only be obtained by the soldier kneeling or lying down, but even in such cases the efficiency of the fire will be greatly diminished in that the flight of a portion of the bullets will be arrested.

176. GROUND IN RELATION TO FIRE ACTION.—The shape and character of the beaten zone are so greatly influenced by the nature of the ground on which the objective stands, that it is important that all who are charged with fire direction should possess a knowledge of how the features of the ground cause an increase or decrease in the probability of fire being effective.

In attack such knowledge assists in directing fire to an advantage; in defense it aids in selecting the best positions for fire action and in minimizing the inherent disadvantages of such positions.

In the following discussion of ground in relation to fire, only plane surfaces are considered.

On level ground the beaten zone varies with the range. (See par. 174.) Its extent is further influenced by the inclination of the ground to the line of sight. Where the ground rises in respect to the line of sight, the depth of the beaten zone is decreased, and is least when the angle between the ground and the trajectory is a right angle. (O—A, plate 6.) Since the beaten zone becomes smaller as the angle of inclination increases, the effect of errors of estimation of range will be more serious.

When the ground falls in respect to the line of sight, the depth of the beaten zone is increased in proportion as the downward slope increases until it reaches its greatest magnitude, when the angle of fall of the bullets is the same as the slope of the ground. (O—B, plate 6.) The fire then becomes grazing and the danger space and beaten zone are nearly the same.

At short ranges the beaten zone will be much increased if the ground behind the objective falls at a gentle slope. At long

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ranges the beaten zone will be larger if the ground falls more sharply.

When the objective is on a crest line the beaten zone is greatest; and part of the fire is grazing when the ground behind the objective is parallel, or nearly so, to the trajectory. (See fig. 1, plate 8.)

When the objective is on level ground, difference of level between the firers and the objective produces the same effect on the beaten zone as when fire is directed at ground inclined to the line of sight. If the fire is from high on to lower ground,

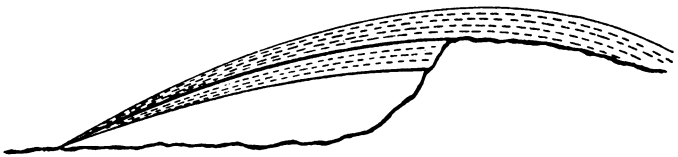

FIG. 1.

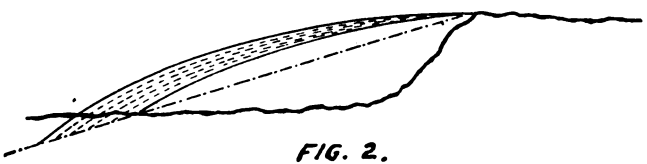

FIG. 2.

PLATE VIII.

the size of the beaten zone is diminished (see fig. 2, plate 8); if from low on to higher ground, the beaten zone is increased. (See fig. 1, plate 8.)

177. SELECTION OF POSITION.—Two objects are to be kept in view in selecting a position for the delivery of fire: First, to

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obtain the maximum effect of fire on the enemy, and, second, to minimize the effect of the enemy's fire.

The apparent crest of rising ground is the point where the line of sight makes a tangent with the ground, and as the line of sight changes for each position of the observer, there may be many apparent crests for the same piece of ground.

Troops defending a slope should always see its foot to prevent there being a dead angle where the enemy may collect. It is frequently necessary for this purpose to advance the firing line down the slope to what is called the military crest as distinguished from the real crest. Advancing down the slope causes the beaten zone of the enemy to decrease, since his objective is on ground which slopes upward with respect to his line of sight and increases the beaten zone of the troops occupying the slope over what it would be if they occupied a higher position on the slope. (See par. 176, above.)

Cases may arise where the slope is such that two or more tiers of fire may be used and the crest used to defilade space on which the supports and reserves are placed.

At short ranges a defiladed space occurs on the reverse of even gentle slopes, greater or less according to the distance from which fire is delivered and the angle of the slope. When the firing line is placed on the crest of a hogback with steep reverse slopes, supports and reserves, even when brought up close will, at all ranges, be but little exposed to fire. In other cases when the crest of a hill is occupied, the vulnerability of the supports and reserves will be decreased if, when the enemy is at extreme range, they are withdrawn from, and when he approaches, closed on the firing line.

The distance between the successive lines of an assailant advancing against troops posted on commanding ground may be less than is normally advisable. When the crest of a plateau is held, supporting troops should be withdrawn from the firing line while the enemy is at long range.

In point of fact, the whole question of the best method of occupying ground is not to be settled by theoretical considerations. Each case must be worked out on the ground to which it is to be applied; and the skill of the commander is shown by the manner in which his dispositions are adapted to the ground.

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CHAPTER III.

THE EMPLOYMENT OF FIRE IN ACTION.

178. EFFICACY OF FIRE.—The efficacy of fire depends upon its accuracy, its direction with reference to the objective, and its volume. (F. S. R.)

Accuracy can only be attained when the range is correctly estimated and the standard of individual marksmanship is high.

If to these conditions be added a correct appreciation of ground on the part of leaders and ability to take full advantage of the ballistic qualities of the rifle through combined action, useful results will be obtained.

Volume of fire is dependent upon the number of rifles employed and the rapidity of fire.

The degree of rapidity of fire is dependent upon the conditions and circumstances of the action.

Rapidity of fire is limited by the requirement of accurate aiming, the necessity of economy of ammunition, and the nature of the objective.

The limit of rapidity of fire in the case of a well-trained soldier is 15 rounds per minute at the shorter ranges at a plainly visible target. The limit of rapidity decreases as the range increases and the visibility of the target diminishes. The limit of rapidity should not be ordered except in a crisis of the action, when it is desired to produce a maximum fire effect in a minimum of time.

179. LIMITS OF EFFECTIVE FIRE.—The size of the shot group of the average soldier for different ranges furnishes a basis for determining the distances up to which individual fire may be expected to be effective.

In the drawings the rectangles represent graphically the mean horizontal and mean vertical dispersions for the average soldier under average range conditions, as determined by actual experiment.

From these comparisons it may be concluded that in action the fire of the individual soldier will not prove effective when directed upon a prone figure at a greater distance than 500 yards, upon a man kneeling at 600 yards, upon one standing beyond 700 yards, or upon a mounted man beyond 1,000 yards.

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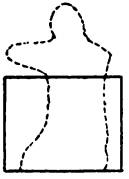

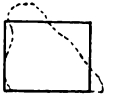

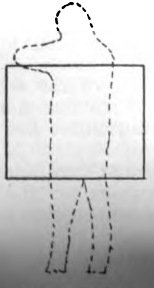

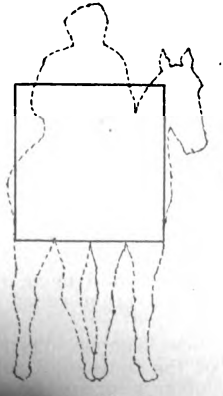

E XXIII

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At the latter distance the fire would usually be effective at a line of skirmishers at five yards interval, and up to 1,200 yards on a line of skirmishers at one yard interval.

Fire upon a body of troops in close order of the width of 12 to 15 yards will generally be effective up to 1,000 or 1,200 yards; upon a body of men with a front of 20 or 25 yards, or upon a section of artillery up to 1,200 or 1,500 yards; upon troops in columns of companies or compact bodies of artillery or cavalry at ranges from 1,500 to 2,000 yards.

Beyond 2,000 yards infantry fire will not usually be effective, except at very vulnerable targets, such as would be presented by large bodies of troops in mass under conditions which favor bringing the objective within the beaten zone.

The distances given above are approximations and are subject to modifications due to such causes as varying skill with the rifle, the state of the weather, the mental and physical condition of the men in ranks, and the greater or less visibility of the target.

180. COLLECTIVE FIRE.—Collective fire may be defined to be fire delivered by a body of soldiers at a common objective and regulated by the will of a common superior for the attainment of some tactical end.

A concentrated collective fire, which is in effect a fire of probabilities, has for its purpose the creation of dangerous areas at or near points on the enemy's line possessing tactical importance. In practice, it consists in covering the particular point with the beaten zone of a sufficient number of rifles to bring about the desired result.

This may be accomplished when there is a good aiming point, correct estimation of the range, and when conditions favor observation of the effects of fire.

The aiming point will not usually be a visible enemy; more often, especially at the longer ranges, it will consist of natural objects, such as trees, hedges, fences, the crests of ridges, which mark the enemy's position.

Correct estimation of the range at distances inside the continuous zone (700 yards) of the rifle is not important, as errors in estimation are compensated for by the flatness of the trajectory of the rifle. As the range increases correct estimates of range become more difficult, and at the same time more

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important, owing to the greater angle of fall and lessening of the danger space.

Range finders are useful in the determination of the range, but are not usually reliable enough to replace estimates by the eye. When the ground is favorable the strike of trial shots or volleys may enable the range to be determined with sufficient exactness. The machine gun is a valuable accessory in range finding, owing to its power of concentration.

181. OBSERVATION OF EFFECT OF FIRE.—Observation of the effects of fire is of great importance in getting good results. This applies to individuals acting alone as well as in collective fire. The most favorable case is where the ground on which the objective stands will show plainly the impact of bullets. An elevation well under the estimated range should first be selected, and if the fire can be observed, the correct range may be obtained by a series of approximations.

The best position to observe the effects of fire is behind, and, if possible, above the party firing, but in this position it must be remembered that bullets which fall short will be most easily seen and consequently will appear to strike farther from the objective than bullets which strike an equal distance beyond.

To an observer on or beyond a flank of the party firing, shots which pass over the objective will appear to fall toward the side on which he is posted and those which fall short, toward the opposite side.

When the surface of the ground is such as not to furnish any indication to an observer at the firing point of the effects of fire, the correctness of the rear-sight elevation and direction of the fire may sometimes be inferred by careful observation of the actions or movements of the enemy. If the assailant finds that the defender's fire is steady and continuous, he may assume that his own fire is ineffective. If the defender sees the front line of the assailant advancing with confidence, but his supports in confusion, he may take it that his rear sight elevation is too great; when his advance is hesitating but continuous, that it is too low; if he halts to fire and gains ground by rushes, that the elevation is correct.

Good field glasses are indispensable in observing the effects of fire and in locating an enemy whose position is not exactly known.

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182. COMBINED SIGHTS.—The use of combined sights is an expedient for getting a greater depth of beaten zone when the range can not be determined exactly, thereby increasing the probabilities of making hits. This is usually accomplished by the simultaneous use by two bodies of men of two rear-sight elevations, one 50 yards over and the other 50 yards under the estimated range. Combined sights should not be used for ranges less than 1,000 yards.

Such a fire loses in concentration and this must be compensated for by the employment of a larger number of rifles. The use of combined sights by bodies of men smaller than a company is of little practical value.

183. VOLLEY FIRING.—Volley firing favors good control, concentration of fire, and economy of ammunition. When volleys are well delivered and placed, they have a moral as well as a material effect on an enemy.

Volleys mean a slow delivery of fire, and hence this class of fire can be employed only when the circumstances of the action make deliberation admissible. The simultaneous discharge of a number of pieces means the discharge of a certain proportion with an inexact aim, and hence a less number of hits may be expected compared to the classes of fire in which each piece is discharged with an exact aim. The number of pieces that can be controlled by a single voice is limited; hence a two-rank formation is the most favorable formation for the delivery of volleys, provided the circumstances of the action admit of such a formation.

For troops behind shelter, acting on the defensive, the employment of volley firing possesses some advantages in the early stages of the enemy's advance.

Volley firing can not usually be employed by troops told off for the assault at ranges inside the effective range of the rifle (F. S. R.), owing to the extended order necessary and to the probable confusion incident to the action.

Volley firing at a retreating enemy may sometimes be used to advantage at the conclusion of a successful assault as a means of recovering full control of the troops confused and out of hand by the advance.

184. FIRE OF POSITION.—The fire of especially selected bodies of troops posted on the flanks of an attacking force or upon

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some dominant position in the rear for the purpose of aiding the advance, is termed "Fire of position." The rôle of such bodies of troops is to cover points of the enemy's lines, selected for their tactical importance, with a beaten zone. Volley firing by such bodies may be usefully employed and the fire should be continued as long as possible without endangering the attacking force.

185. INDIRECT FIRE.—By indirect fire is meant fire directed at an objective over an intervening obstacle which screens the objective from an observer at the firing point but which does not defilade it from fire from that point.

The application of such fire is dependent upon the curvature of the cone of fire, and it is practicable only when there is a well-defined aiming point in or near the plane of fire, or where, as in siege operations, special arrangements may be made for resting rifles at the proper angle for reaching important stationary objectives. The opportunities for the employment of this kind of fire in service are rare.

186. THE TIME FOR OPENING FIRE.—Beyond the so-called effective ranges of the rifle (F. S. R.), the difficulties attendant upon getting good results with rifle fire increase rapidly with the range. The appropriate time for opening fire can not therefore be stated precisely. Each case presents a separate question, the determination of which is dependent upon the circumstances attending it.

Concealment and invisibility operate to restrict the full powers of the rifle, both for the offensive and defensive, but these factors are more potent for troops on the defensive, since movement which can not be concealed adds to visibility. This circumstance together with a more available ammunition supply indicates that the defensive may open fire at earlier stages of the action than the offensive. For the latter an early opening of fire should be by special bodies of troops using fire of position.

In any case it should be borne in mind that long-range rifle fire can have but a remote influence on the final outcome. The invariable rule for the employment of fire is that decisive results can only be obtained when the enemy is near enough to be hit with certainty. Economy of ammunition, especially at the long and medium ranges, is a matter of capital importance, and no consideration should be allowed to bring about a failure of ammunition at the critical stage of the action.

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It may be said further that troops armed with the rifle should not be employed in a rôle which can better be performed by machine guns and the field artillery.

187. NIGHT FIRING.—The invisibility afforded by darkness neutralizes the powers of the rifle to a great extent.

In night attacks the purpose of the offensive is to gain rapidly and quietly a position where the issue may be decided in a hand-to-hand encounter. Fire action is, therefore, a subordinate consideration.

On the defensive, when a night attack is apprehended, preparations should be made to sweep with fire the ground over which the assailant must advance. Special arrangements may sometimes be made for resting rifles on the parapet, so that the ground in front will be suitably covered. The fire of the defense should be well controlled, and to this end volley firing may be advantageous. Artificial illumination may, by revealing the movements of the enemy, add to the effect of the fire. It should be borne in mind that the tendency at night is to shoot high. In night operations of small parties fire may be well directed when a bright, well-defined light, such as a camp fire, is presented as an aiming point. In such a case, a slight illumination of the front sight is required.

Ranges to distant lights may be determined readily at night with range finders dependent upon a measured base.

188. ESSENTIALS OF EFFECTIVE FIRE.—The effect of fire at any stage of an action is dependent upon fire discipline, fire control, and fire direction. The first is a fundamental requirement without which fire control and fire direction are impossible.

If the latter essentials are lacking, the first would be of little use. The three requirements are, therefore, closely related and interdependent.

Fire discipline implies, besides a habit of obedience, a control of the rifle by the soldier, the result of training, which will enable him in action to make hits instead of misses. It embraces taking advantage of the ground; care in setting the sight and delivery of fire; constant attention to the orders of the leaders, and careful observation of the enemy; an increase of fire when the target is favorable, and a cessation of fire when the enemy disappears; economy of ammunition. Men must be made acquainted by training with battle conditions in which fire control is wanting or impossible, and taught to act properly in

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such cases. Fire control and fire direction involve a knowledge on the part of the officer of the ballistic qualities of the rifle and of the influence of ground. To these must be added ability to estimate distances correctly and a degree of self-possession which will enable him, in the stress of action, to give commands which are the outcome of knowledge and sound judgment.

Fire control consists in the enforcement of fire discipline, the imparting to the men of orders issued by higher commanders, and in assisting the men who are firing with advice to enable them to carry out their duty more effectually. It generally embraces the designation of the elevations to be used, the number of rounds to be fired at each halt, and the kinds of fire to be used. Fire control usually devolves upon platoon commanders, section and squad leaders.

Fire direction consists in determining according to the governing tactical idea of the action:

1. The time for opening fire.
2. The proper tactical extension of the men or density of the firing line.
3. The selection and designation of the objects to be fired on and their allotment to different portions of the firing line.
4. The choice of ground to be occupied within the limits of the sphere of action of the commander.
5. The reenforcement of the firing line.
6. The supply of ammunition.
7. The determination of the moment for advancing to the bayonet assault.

Fire direction usually pertains to the company and higher commanders, but the duties of fire direction may, according to the circumstances of the action, devolve in part upon the subordinate officers.

CHAPTER IV.

PRELIMINARY TRAINING AND INSTRUCTION PRACTICE.

189. PRELIMINARY TRAINING.—As much of preliminary field practice does not require the use of ball cartridges, this class of instruction will be imparted to larger units as well as individuals.

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In the firing which the soldier does on the Class A range, he is trained to acquire a high degree of skill in firing at targets selected for their visibility and at ranges which are known. This course is insufficient to fit him to make effective use of his rifle in action. He will be trained to pick up an indistinct target, such as is likely to be presented in war, correctly estimate its range, to quickly open fire and to make the best use of the ground. Officers and leaders will be exercised in the duties of fire control, fire direction, and observation of the effects of fire, in the use of ground, and in mutual support. Facility in locating indistinct objects and in estimating their distances and pointing them out to others is very important. The use of field glasses will be taught in this class of instruction. Exercises formed to stimulate the soldier's power of observation should be commenced at the earliest period of his training and continued throughout his service, in order that he may appreciate by daily association the necessity of cultivating a quality of such importance in modern warfare. In war the soldier will, generally speaking, be required to observe the actions of his enemy, folds or features of ground which will afford cover to himself or concealment to his enemy, or natural objects on or near the hostile position. Peace training should therefore give practice in these conditions. Full advantage should be taken of the estimating distance drills (Chap. V, Part II) for imparting as much of this instruction as is practicable at the place where these drills are held. Further instruction under this head, together with exercises in taking advantage of cover, proper tactical use of the ground, and mutual support, will be imparted during practice marches, while en route to the target range, or when awaiting turn to fire. The object of each exercise should be made plain to the man under instruction in order that he may fully profit by the instruction.

The following is suggested as a guide:

The company being formed to march to the target range, the company commander explains to the men that although they have attained a high degree of proficiency in firing at known distances at clearly defined objects, there is still a great deal to be done before they can be considered as efficient soldiers; that they will now begin where their previous training in rifle firing left off and will be asked to judge the distances for them-

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selves and hit the supposed enemy, to shoot quickly and show that they can take advantage of fleeting opportunities; to scout toward the enemy, and, while not exposing themselves, to discover and shoot the enemy; to improvise cover and to locate the enemy who is partially concealed. He ends by telling them that the soldier must, when marching cross country or when moving with a patrol, keep his eyes open, note the features of the country, and be able at any time to say what he has seen.

He marches the company toward the target range, halts them en route, and questions individual soldiers as to what they have seen. The direction, with reference to points of the compass, should in all cases be stated. He makes the necessary comment on the answer received to correct false impressions or make clear the necessity for closer observation and continues the march, halting at convenient intervals to continue the exercise. While on the range engaged in firing, he endeavors to impress upon the men the necessity of observing the effect of fire. Advantage should be taken of dry days, when the shots fired raise a dust, to question the firer as to his observation and the inferences he has drawn from it. A portion of the company not required for firing should be sent off the range under an officer or an experienced noncommissioned officer for further training.

An E target should be placed on the near slope of a hill with a background of dry grass or brown rock. On arriving at a distance of about 500 yards from the target and in plain view of the hill on which it is placed, the squad is halted and told that the target is on the hill and is not concealed and they are required to look carefully and locate it if possible. If they can not do so they are moved up nearer. When they have arrived at 300 yards, if they have not located the target, it is pointed out by the officer or noncommissioned officer in charge of the party. The advantage of securing a similar background for themselves when firing on the enemy will then be pointed out.

To teach the soldier how to advance undetected to decisive range and shoot the enemy:

An E target is placed in the position as described above, the squad being formed at 800 yards. One man, as an observer, is placed in a pit or behind secure cover near the target and is provided with a mirror, a rifle with blank ammunition, and a

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danger flag. The observer places the mirror so that while under cover he can see in the mirror the reflection of the ground between himself and the squad. The observer being in the pit and the danger signal removed, the instructor points out to the squad the position of the target. He explains that the range is too great to justify an expectation of hitting the target at the first shot and that to fire and miss would frighten an enemy and cause him to take cover or run away. He directs one of the men to advance on the target, keeping himself concealed until he is within easy range and has a clear view of the target. The man then advances on the target, taking advantage of inequalities of the ground, clumps of grass, trees, etc. When the observer sees in the mirror the man who is advancing, he fires a blank cartridge. The man is brought back and his fault pointed out and he is made to repeat the exercise.

Locating indistinct moving targets can be practiced when the men are on a practice march by sending out men to the flanks to, say, 500 yards, and directing them to march parallel to the column and endeavor to keep concealed from view, the men in the column being directed to keep a sharp lookout for the flankers and report when they are seen.

Other exercises will suggest themselves to the company commander. The following exercises are among those suggested by Maj. A. W. Andrew, late chief instructor at the school for musketry, Bellary, India:

1. To show the men by practical illustration the advantages and disadvantages of short and long rushes.

2. To let each man realize from actually doing it how difficult it is to shoot well if he begins to shoot immediately after a long rush when his chest is heaving.

3. The men to be placed on a defensive position and to be shown by practical example the vulnerability of men:

a. Making long rushes.

b. Making short rushes.

This can best be done by giving them blanks and ordering them to fire, first at a squad advancing by long rushes of 100 yards at a time, and then at a squad advancing by short rushes of ten to fifteen paces at a time.

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4. Each man should, in the same way, be shown by actual illustration the comparative vulnerability of:

a. Squads rushing forward in regular sequence from right to left, as compared with

b. Squads rushing forward at irregular intervals from different points of the attacking line.

5. Each soldier should be shown by actual illustration how difficult it is to hit or even see a line of infantry lying at 1,000 yards or over.

6. Each man must understand how to conceal his trench and how to protect himself on every occasion from flank and enfilade fire.

7. Each man must clearly understand how movement of any sort discloses his position at much greater distances than would be the case if he remains quite still.

8. Each man must be able to provide himself with substantial head cover and make loopholes giving him a wide range of fire.

9. Each noncommissioned officer must know the object of a holding attack and how he should expend ammunition when carrying it out.

10. Each noncommissioned officer must show by practical exemplification that he knows how and when to use covering fire and mutual supporting fire.

11. Each man must understand the great importance of flank, enfilade, and concentric fire.

12. Each man must understand the great importance of surprise by fire, and must be taught how to entice his enemy within range and then shoot him.

13. Each man must be able to describe briefly the point on which he has located the enemy, explain it to his comrades on his right and left, and so insure its being passed along the line. The enemy's location should be described by using the clock-face notation as prescribed for the range, thus: A man at 700 yards at 11 o'clock. The squad always faces 12 o'clock.

14. Each man must be impressed with the importance of communicating his back-sight elevation to his comrades when he sees that his shot has struck the target or the enemy.

15. Each soldier must understand how to take advantage of the flat trajectory of his rifle.

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16. Each man must know what is meant by a good or bad field of fire, and must show by the position he takes upon varying ground that he knows how to make use of his knowledge.

17. When firing from a ridge each man must understand how important it is to keep his bullets just in front of an advancing line.

18. Each soldier must be as capable of firing up or down hill as on the level, and should also be shown by practical examples the allowance he must make in elevation when so firing as compared with firing on the level range.

19. Each man must not only know how to dig himself into the ground and provide head cover and loopholes, giving him a good field of fire and protection from shrapnel as well as rifle fire, but must be impressed with the importance of insuring his position being a comfortable one, so that he can sit in it for several hours without constraint.

20. During every field-firing exercise, and after the work has been in progress for some time, each man should be asked to say what the idea is the company commander is carrying out. This forces them to pay attention to the preliminary instructions and gives the company commander confidence that each man, by thoroughly grasping the idea, will be capable of carrying it out to the end.

21. Each man must be constantly tested to see if he recognizes "dead" ground in his vicinity.

22. Each man must realize that "Rapid fire" means rapid loading only, and that although he must be an expert in rapid loading, he must, while doing so, keep his eyes on the enemy, watching for opportunities, and fire carefully.

23. Each man must be frequently exercised in repeating test messages such as are likely to be required in the firing lines.

To impress the soldier with the necessity for fire discipline, to test him in the use of those faculties which have been trained by the foregoing exercises, and to train the officer in fire direction, fire control, mutual support, and the correct use of ground is the object of field practice.

190. INSTRUCTION PRACTICE.—Instruction practice is compulsory for all who fire the regular course of known distance practice, and where a Class B range is not available it will be conducted on the Class A range, which will be prepared

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this firing by removing the range stakes, placing rows of brush or logs or low parapets across the range to break up the surface or otherwise destroying indications of distance, so that practice may be had at as nearly unknown distances as possible. Pits for bobbing targets, cover for falling targets, apparatus for moving targets, and head cover for observers will also be provided. For targets and apparatus see Chapter I, Part VI.

The classes of fire which are required in "Instruction Field Practice" are:

1. Firing from behind cover without a rest.
2. Firing over a wall or parapet with a rest.
3. Firing at bobbing targets.
4. Rapid fire at falling targets.
5. Firing at moving targets.

Where a Class B range is not available, the instruction field practice conducted on the Class A range will be extended to include maneuvering as large a unit as the range will accommodate against various classes of targets and training the leaders in fire control.

The amount of ammunition available for field practice will depend upon the number of men who are excused from any of the three known distance courses and the officers who do not fire.

After deducting the necessary number of rounds for the probable needs of the supplementary season, expert rifleman's test, and the proficiency test, 40 per cent of the remaining allowance will be expended in instruction field practice. Where a Class B range is not available, the entire remaining allowance will be expended in instruction field practice. If the allowance of ammunition will admit, at least five rounds should be expended in each of classes 1, 2, 3, and 4, and ten rounds in class 5, as indicated above. Firing in all classes will be as nearly as possible at unknown ranges and for rapid fire at less than 500 yards the battle sight will be used. The method of indicating hits in classes 1, 2, 3, and 4 is left to the discretion of the company commander.

Cover for class 1 firing will be improvised from sand bags, stones, mounds of earth, etc. For men who fire from the right shoulder, the firing will be done from the right side of the shelter. For men firing from the left shoulder, the firing will

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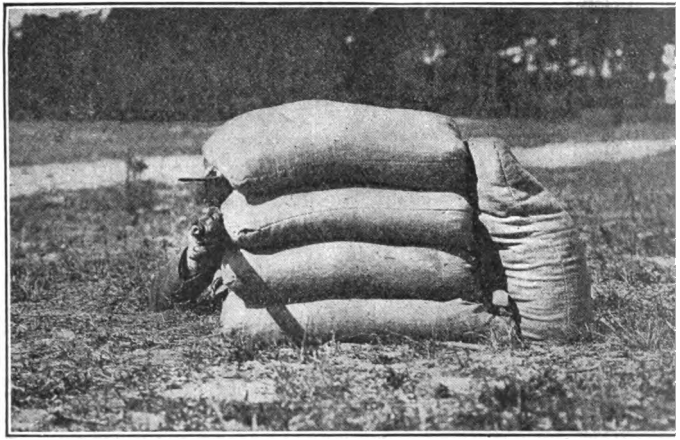

PLATE IX, FIG. 1.

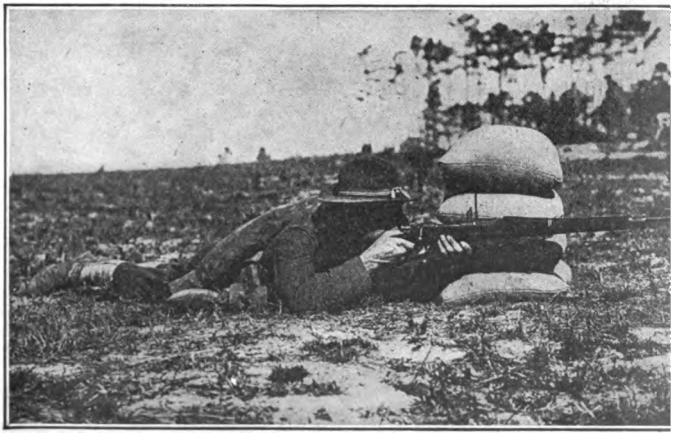

PLATE IX, FIG. 2.

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be done from the left side of the shelter. Slow fire will be used. When not firing, the soldier will remain completely hidden from the front. When firing, as little of the body as possible will be exposed. (See Plate 9.)

Target: Any suitable field target.

Distance: Not less than 300 yards.

For class 2 firing a parapet or wall should be constructed of convenient height to be fired over in the kneeling position. In firing the rifle will be rested on the parapet or wall at the balance and not near the muzzle. Only so much of the head should be exposed as is necessary to take aim. In this practice slow fire, at a range not to exceed 500 yards, will be used and the soldier will remain concealed while not firing. (See Plate 10.)

Target: E or F.

In class 3 firing the H target will be used. The firing is at 5 of these targets in the hands of men behind the parapet at unknown points at about 500 yards from the firer, or in pits which are so placed as to be in echelon at distances from 250 to 450 yards from the firer. The order in which the targets are to appear will be provided for in advance, but will not be made known to the firer. Where the buzzer annunciator system is installed, the targets may be called as desired.

At a signal from the firing point the first target appears and remains in sight five seconds; five seconds after it disappears the second target appears and remains in sight five seconds. The soldier being at the ready in the prone position, fires one shot at each target while it is in view. The other targets appear and disappear as explained for the first two.

In class 4 firing 5 targets G will be placed in line in a trench deep enough to screen the mechanism, with intervals of 5 yards. The firer will be stationed at a distance between 300 and 400 yards from the targets and will be at the ready in the prone position. The targets having been set, the officer conducting the practice will give the necessary commands for rapid fire, and thirty seconds after the command "Commence firing" will give the command "Cease firing." The soldier endeavors to fire five rounds at will and to knock down the five targets. He ceases firing at command.

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PLATE X, FIG. 1.

PLATE X, FIG. 2.

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In class 5 firing the soldier is at a distance of from 200 to 300 yards from the target in the prone, kneeling, or sitting position. The target is on the firer's right under shelter. The target used may be a kneeling paper silhouette pasted on the C target. At least part of this practice will be at the prescribed moving target. The firer being in the position of ready, a signal is given at the firing point and the target appears and moves across the range at a uniform rate of speed going 50 yards in thirty seconds, when it disappears behind shelter. The soldier fires five shots while the target is in view. The danger signal is then displayed, the target run out and the hits indicated to the firer by placing a white disk over each of them in succession. The target is then run behind shelter, the shot holes pasted and the danger signal removed. The soldier then takes position for firing and the target is run across the range from left to right, the procedure being the same as in the run from right to left.

Where the allowance of ammunition will permit, the amount of firing at the moving targets should be greatly increased, the targets being moved at the rate of a man running and for the longer ranges (300 to 500 yards), the iron silhouette target R being placed on the frame. If range conditions will permit, a track for the moving target should be placed diagonally across the range in addition to the track at a right angle to the range.

In firing at moving objects men will be instructed to aim on an object moving across the front, then moving the piece with the object to carry the aim in front of the object a distance depending upon the range, rate of movement, and direction taken by the object. The motion should be continued till after the rifle has been fired. Aim should be taken at the head of a body of troops marching by the flank. In aiming at an objective moving directly or obliquely toward or away from the firer, allowance for elevation must usually be made by aiming lower or higher.

In aiming at an objective which appears and disappears, the rifle should be brought to the shoulder on its appearance and aim taken as rapidly as possible at its lowest point.

The following table, computed for a muzzle velocity of 2,700 foot-seconds and objects of known rates of travel, shows the

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distance in feet of the aiming point in front of the point on the object which it is desired to strike from 100 to 1,000 yards inclusive:

Field Practice.

Yards (range).	Man walking.	Man double timing.	Horse walking.	Horse trotting.	Horse running.
100	0.6	1.0	0.7	1.4	2.0
200	1.2	2.2	1.4	2.9	4.3
300	1.9	3.5	2.2	4.5	6.8
400	2.7	4.9	3.1	6.3	9.5
500	3.6	6.4	4.0	8.3	12.5
600	4.5	8.1	5.1	10.6	15.8
700	5.5	10.0	6.3	13.0	19.5
800	6.7	12.1	7.6	15.7	23.6
900	8.0	14.3	9.1	18.7	28.0
1,000	9.3	16.8	10.6	21.9	32.8

In firing at a man walking across the front, therefore, at 200 yards, aim should be taken about one-half the depth of the man in his front; in firing at a man double timing at 200 yards, about his depth in front.

In firing at a horse walking at 400 yards, aim should be taken one fourth the horse's length in his front, and for a horse running at 300 yards, aim should be taken at a point one-half his length in his front.

The fire of an individual will not usually be effective at a single man moving across the front at a range of more than 300 yards or at a single horseman above 500 yards.

CHAPTER V.

REGULAR PRACTICE.

191. SYSTEM OF INSTRUCTION.—The practice will be divided into two parts—i. e., individual and collective.

Individual practice will include for individual men the estimation of distances, observation of fire, rapidity of opening fire, use of the ground, and observation of effect of fire.

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Collective practice will include for squad, platoon, and company commanders, fire direction, fire control, use of the ground, observation of the effect of fire, ammunition supply, and mutual support.

Instruction will be carried out under simple tactical schemes or exercises devised by company or battalion commanders and made to simulate as much as possible actual war conditions. The schemes or exercises should be made progressive in each class and from one class to another, beginning with the individual exercises. It should be borne in mind that the instructional value of field practice will depend largely upon the care and judgment exercised in framing the tactical schemes, selecting the ground, and placing the targets.

Company officers will not be permitted to fire with their men. Their duty consists in supervision and control, criticism, and guidance, and anything which causes them to neglect these important duties is to be deprecated.

In exercises involving subdivisions of the company the company commander will supervise the exercise, and at its close will make suitable criticisms and comments on its conduct.

In exercises involving the entire company, the battalion commander will perform the duties prescribed above for the company commander.

192. GENERAL PRINCIPLES.—The following principles and rules will govern in all field practice:

1. Every exercise will represent an episode or fraction of a combat in which, for those taking part, there should be some element of surprise or uncertainty.

2. All movements will be executed with regularity by proper tactical commands and means.

3. In order to maintain fire discipline and make fire control possible, commands for firing will be given in a tone of confidence, in proper sequence, and exactly in accordance with the drill regulations.

4. Close-order formation in view of the targets will not be permitted. The advance to the ground should be made under service conditions.

5. As the results of collective fire depend upon individual shooting, men should be enjoined to aim at individual figures.

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6. As the number of figures struck in collective fire count in the record as well as the actual number of hits made, care should be taken by commanders of units that the fire is so directed as to get the best results.

7. In case of a sudden change of objective from a point outside of the point-blank range to a point inside the point-blank range, the rear-sight leaf should be laid down.

8. The correct estimation of distances is of great importance in getting good results in field firing and in service.

Inside the effective range, 1,200 to 600 yards (see F. S. R.), reliance must be placed chiefly upon estimations by the eye in connection with trial shots. The effect of fire will be closely observed.

9. In searching for indistinct targets and directing fire thereon, the field glass will be used to the fullest extent in searhcing the ground in front. Before fire is opened each man should know the exact location of the target, so that he may fire with good effect. Sometimes the location of the target may be indicated by the strike of a single trial shot.

10. Cover and concealment are of great importance and they should be practiced throughout all exercises according to the requirements of actual war.

11. Promptness in opening fire is of the greatest importance.

12. Tactical considerations will govern in the choice of a target whenever more than one is in view. As a rule the nearest enemy is the most dangerous, upon whom the fire should be directed. Greater vulnerability may determine a change of objective.

13. When orders and commands are heard with difficulty owing to the noise of the action, they will be repeated by squad leaders or else transmitted from man to man.

14. At the beginning of each exercise the commander of the unit taking part will be informed as to the tactical idea involved and as to the general procedure to be followed. He will not usually be interfered with in any way in the course of the exercise. At the conclusion of the exercise, mistakes and errors of judgment will be pointed out by the officer in charge.

193. RANGE REGULATIONS.—A suitable range party will be detailed by the officer supervising the firing consisting of an

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officer as range officer and a sufficient number of men to act as target and signal men and range guards.

The duties of the range officer are to prepare the targets, to superintend their placing and manipulation, to see that the range is safe and, where necessary, to post range guards to prevent persons from entering the area of fire, to record and report the result of the firing.

Every precaution will be taken to provide for the safety of markers, target men, and others whose duties require them to be anywhere within or near the area of fire. A point which will be continually in view of the officer or noncommissioned officer in charge of the firing line throughout the exercise will be selected from which to display the danger signal. This point will be made known to all engaged in the firing. No firing of any kind will be done while the danger signal is displayed. Should the danger signal appear while an exercise is in progress, the entire command will be halted, and the movement resumed when the danger signal is removed.

In all cases where a revolver shot is prescribed as a signal, it is fired either from the firing point or from the targets to indicate that the squad is under fire.

A complete record of the exercises will be kept which will include the following:

1. The designation of the company and nature of exercise; i. e., whether individual or collective.
2. Date.
3. Kind of target and number or description of exercise.
4. Actual distance.
5. Estimated distance
6. Number of men.
7. Number of shots.
8. Number of hits.
9. Percentage of hits.
10. Number of figures struck.
11. Percentage of figures struck.

Where there is a time limit on the exercise the percentage will be figured on the number of shots allowed instead of on the number of shots fired. The entries under heads 1 to 7, inclusive, will be made by the officer conducting the practice. The entries under heads 8 to 11, inclusive, will be made by the

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range officer. Both officers will certify to the correctness of the record.

No indication as to the location or number of hits or the strike of the bullets will be given to those engaged in the exercise until the completion thereof.

When field buzzers form part of the signal equipment of a post, their use greatly facilitates communication and expedites the conduct of exercises.

Where these have not been supplied, communication must be by means of the telephone or a simple code of flag signals.

194. EXAMPLES OF EXERCISES.—The exercises given below are to be carried out if practicable, but will be altered or varied in the discretion of the officer supervising the practice, if circumstances so demand.

INDIVIDUAL PRACTICE.

(Exercise No. 1.)

OBJECT.—To teach men to take cover promptly in fighting formation, to estimate the range correctly, and to fire upon an enemy with good effect.

SITUATION.—Squad of 8 men in patrol formation is fired upon suddenly by an intrenched enemy at range between 300 and 500 yards.

ACTION.—Squad deploys promptly at revolver shot, takes such cover as is available, each man firing at target in his immediate front, and ceasing to fire when his target falls.

TARGETS.—Eight falling targets G set in shallow trench to represent enemy firing in prone position from cover.

AMMUNITION.—Five rounds per man.

TIME.—Three minutes from revolver shot.

(Exercise No. 2.)

OBJECT.—To teach men to watch the ground to the front, to estimate range to the enemy correctly, and fire upon him with good effect.

SITUATION.—Squad of 8 men constituting a sentry squad (F. S. R.) stationed so as to watch approaches in certain direction. Squad is fired upon by enemy who has approached to within a range of 300 to 450 yards.

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ACTION.—At revolver shot which indicates enemy's fire men take position for firing, estimate the range individually, each man firing at the target in his immediate front.

TARGETS.—Silhouette figures on staves in hands of men in pit. Targets are made to appear and disappear somewhat irregularly. Six exposures are made for each figure, each exposure being about five seconds in duration. Interval between exposures about five seconds.

AMMUNITION.—Five rounds per man.

TIME.—As provided under "Targets" above.

(Exercise No. 3.)

OBJECT.—To teach men to locate an indistinct enemy and to fire on him with good effect.

SITUATION.—Single scout acting as point or flanker of small patrol is fired upon by a scout of enemy at range between 450 and 600 yards.

ACTION.—Scout takes such cover as is available at revolver shot, endeavors to locate enemy and to open fire upon him.

TARGET.—Kneeling silhouette E so placed as to be indistinct.

AMMUNITION.—Five rounds.

TIME.—Three minutes from revolver shot.

(Exercise No. 4.)

OBJECT.—To teach men to fire on an advancing enemy.

SITUATION.—Squad of 8 men in extended order at four or six paces interval representing a patrol advancing over open country is fired upon by hostile patrol advancing.

ACTION.—Squad halts, takes cover, and opens fire, each man firing at the target in his immediate front.

TARGETS.—Eight silhouettes on disappearing apparatus (Target I). Targets to appear in succession at about 600, 500, and 400 yards. Kneeling silhouette to be used at first and second appearances, and prone on the third.

AMMUNITION.—Ten rounds per man.

TIME.—Each appearance to be for one minute, interval between consecutive appearances one minute.

In order that each man in the above exercise may have no difficulty in locating his own target, it might be well to employ fewer men than a squad of 8.

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COLLECTIVE PRACTICE.

(Exercise No. 1.)

OBJECT.—For squad, to show that ill-defined or partially concealed targets representing an enemy may be picked up, the range estimated, and fire directed thereon with good effect.

SITUATION.—A squad under an officer or noncommissioned officer is on the march when they are fired upon by a partially concealed enemy at a distance between 400 and 600 yards.

ACTION.—At revolver shot, which indicates fire of the enemy, squad is halted and put under nearest available cover. Officer or noncommissioned officer with field glasses, aided by members of the squad, searches for group representing enemy. As soon as enemy is discovered he is pointed out to all the members of the squad, range is estimated, and fire is directed on the group. In getting range, one or two trial shots may be used if desirable.

TARGETS.—From 8 to 12 kneeling silhouettes are so placed among trees, shrubs, or grass as to be partially concealed, requiring some search to be found.

AMMUNITION.—Five rounds per man.

TIME.—Three minutes from revolver shot.

(Exercise No. 2.)

OBJECT.—For squad, to illustrate fire control by leader, including illustration of use of the battle-range sight.

SITUATION.—A squad under an officer or noncommissioned officer in line of skirmishers advancing against partially concealed enemy between 600 and 800 yards to engage him. While engaged with this party the squad is fired upon by another party of the enemy within battle range and in an oblique direction.

ACTION.—When squad comes in view of first group of enemy, revolver shot is fired. Squad halts and takes cover. Search is made for targets representing the enemy, and when found fire is opened. After one minute, during which 5 rounds are fired, the advance is resumed in the direction of the enemy, when squad is fired upon by enemy represented by group of figures in a direction oblique to the front. The officer or noncommissioned officer in command causes his squad to make the necessary change of

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front and opens fire for one minute, during which 5 rounds are fired upon the new objective so as to give the most effective results.

TARGETS.—Target I represented by group of 8 kneeling figures on disappearing apparatus.

AMMUNITION.—Ten rounds per man.

TIME.—One minute from revolver shot, at each target.

(Exercise No. 3.)

OBJECT.—For squad to illustrate fire control, including the use of the battle-range sight.

SITUATION.—Squad marching as a patrol under officer or non-commissioned officer encounters a party of the enemy at a distance between 550 and 700 yards, the squad halts and engages the enemy, firing 5 rounds, after which the advance is resumed. While advancing the squad is assailed by another party of the enemy which advances rapidly as though endeavoring to make a flank attack.

ACTION.—At first encounter squad halts at command of leader and opens fire, after which the advance is made in line of skirmishers. At second encounter squad is halted and fire opened at nearer group of the enemy with greatest possible effect.

TARGETS.—First party of enemy represented by group of 8 kneeling silhouettes on disappearing apparatus (Target I), which appear for one minute and then disappear. Second party of enemy represented by group of 8 kneeling silhouettes on sled (Target K). First target outside of battle range. Second target inside of battle range.

AMMUNITION.—Ten rounds per man.

TIME.—As provided under "Targets" above, for first target. Target K to be moved at the rate of a horse trotting for 150 yards and then halted. No firing permitted after target halts.

(Exercise No. 4.)

OBJECT.—For squad on the defensive, to illustrate fire discipline and fire direction while firing on an advancing enemy, using parapet of trench as rest for rifle.

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SITUATION.—Squad under officer or noncommissioned officer takes designated position and constructs suitable shelter trench, a time limit to be set dependent on soil. During this interval of trench construction range finders, if available, may be used on one or more prominent points in front to assist leader in his estimation of distances. At the end of time limit of trench construction, advance of enemy is simulated by consecutive appearances of groups of silhouettes which appear and disappear. These groups, three in number, are placed along probable line of advance of the enemy.

ACTION.—Squad having intrenched, a revolver shot announces the appearance of the most distant target. Target remains up one minute and disappears. When target appears leader estimates the range and fire is opened. Two minutes after the first target disappears the second target in order appears for one minute and then disappears. Action same for third target. Targets are fired upon with greatest possible effect as they appear in succession, using the parapet as rest for rifle.

TARGETS.—Eight kneeling silhouettes on disappearing apparatus (Target I). The most distant target is outside the battle range, the nearest inside the battle range, and the other target at an intermediate range.

AMMUNITION.—Fifteen rounds per man.

TIME.—As provided under "Action" above.

(Exercise No. 5.)

OBJECT.—For squad on the offensive; to illustrate squad moving to attack enemy in position.

SITUATION.—Squad under officer or noncommissioned officer advancing in line of skirmishers to attack enemy in position at effective range (not less than 600 yards). Creeping up on enemy illustrated if ground permits.

ACTION.—The squad being in march, revolver shot indicates appearance of enemy at the objective point. Squad is halted, range is estimated, and fire opened. Target remains up one minute and then disappears for one minute, when it reappears for one minute. When the target disappears, the squad resumes the advance, halting again to fire when it reappears.

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In this way the advance of the squad is regulated. If the ground is suitable, a line of falling targets may be placed so as to come into view at some point of the advance. When this occurs, fire should be directed on them, and when 50 per cent have been knocked down the advance on original objective may be resumed. Number of rounds at each halt at the discretion of the officer in command.

TARGETS.—The objective target to consist of 8 kneeling silhouettes on disappearing apparatus (Target I). A second group of 8 falling targets (Target G) is so placed as not to be visible in the early stages of the advance. This group is placed in position to flank the advance.

AMMUNITION.—Not to exceed 20 rounds per man.

TIME.—As provided under "Action" above.

(Exercise No. 6.)

OBJECT.—Collective practice for the company on the offensive, no support or reserve being used. Supplying ammunition to the firing line also illustrated if practicable.

SITUATION.—The company in line of squads under cover at a distance of about 1,000 yards from the objective is ordered to advance. The advance is conducted in accordance with the general rules prescribed in the "Drill Regulations" for the company in action on the offensive. The movements of the firing line will, however, be regulated by the appearance and disappearance of the targets as hereafter described. A flanking group of the enemy is encountered and also a party of the enemy in position.

ACTION.—The advance having been taken up, the enemy represented by group target appears and opens fire. The company deploys and the men are ordered to take cover and position for firing. Range is estimated by officer in command and fire is opened. The kind of fire to be employed at this range and throughout the advance to be such as to give the most useful effect, account being taken of the size of the group fired at and the range. The target is exposed for one minute and then disappears. The disappearance of the target is the signal for another advance. At the end of forty-five seconds the target reappears, upon which another halt is made and fire opened. This procedure is continued throughout the advance, the ap-

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pearance and disappearance of the target governing the movement. As the line advances a line of falling targets in a trench is brought into view, and at least one-half of them must be knocked down before the advance is resumed. At another point a line of moving figures will show. At the last halt representing the point from which the final assault will be delivered, bobbing targets will appear to represent enemy firing over parapet. The firing line will not advance beyond a point 100 yards from the objective. At a convenient point, the supply of ammunition in the firing line will be replenished.

TARGETS.—The objective target will consist of a line of 24 kneeling silhouettes on the disappearing apparatus (Target I). The flank group will consist of a line of 24 falling targets placed in a shallow trench (Target G). The moving target will consist of a row of 8 kneeling figures on a sled (Target K or L). The bobbing targets will consist of 8 or 10 silhouettes on staves held in hands of men under shelter (Target H).

AMMUNITION.—Not to exceed 40 rounds per man.

(Exercise No. 7.)

OBJECT.—Collective practice for a company to illustrate fire of position and to teach company officers to direct the fire of a company upon a distant target. This includes estimation or determination of the range, observation of the effects of fire and correct judgment as to the effect of wind, light, and other causes of deviation and use of combined sights; all of these under conditions which approximate those of service.

ACTION.—The target being placed in position, the company advances in suitable formation toward it from a point about 2,000 yards distant. The halting points are indicated to the company commander by the battalion commander. These halting places should usually be at a point within the zone of so-called serious ranges (see F. S. R.), 1,800 to 1,200 yards. Three halts in all will be made. At the first halt the company commander causes his company to take position for firing, estimates or determines the range, and opens fire. Three volleys are fired, followed by fire with counted cartridges, 3 in number.

The effect of the fire should be carefully observed with a view of correcting wrong estimates and obtaining the best possible results.

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When fire with counted cartridges has been completed, a count of hits will be made, shot holes pasted, and targets set up. The advance is resumed and the same procedure is followed at the second and third halts. The advance from one firing point to another should be under service conditions as to formations and use of cover.

TARGETS.—Four rows of silhouette figures placed in column, the distance between rows being 15 yards. The front row of figures to consist of 16 falling targets; each of the remaining three rows of figures to be composed of 16 kneeling silhouettes, the interval between individual figures to be 6 inches. The target thus composed has little semblance in form to any target that would be met with in service. From the distribution of hits on the four lines of figures an idea may be formed as to the placement of the shot group with reference to the target. The line of falling targets which compose the first row will, in falling, give an effect which may be observed from the firing point. This, in conjunction with observation of the strike of the bullets on the ground, will give indications as to the effect of the fire somewhat similar to those that would be had in war.

NOTE.—When greater ranges than those specified in this exercise are to be found and the extra ammunition is available, experimental collective firings may be conducted on suitable targets up to the limit corresponding to the maximum graduations on the rear sight leaf.

(Exercise No. 8.)

OBJECT.—Collective fire for section or platoon to illustrate the principles of covering fire and mutual support.

SITUATION.—A section or platoon is on duty as picket in an outpost line with double sentinels.

ACTION.—At a revolver shot the sentinels report the presence of an enemy. The picket falls in and forms line of skirmishers; the sentinels clear the front and join the picket at a double time. Three minutes after revolver fire the first target appears and remains in sight one minute, then disappears. Two minutes later the second target appears and remains in sight one minute and disappears.

The platoon retires by alternate sections for about 400 yards. The section leaders open fire upon appearance of the target.

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The movement of one section will be covered by the fire of the other.

TARGETS.—Two targets, I, of 16 silhouettes each. The first at 400 yards from the line of sentinels, the second 200 yards nearer the line of sentinels.

AMMUNITION.—Ten rounds per man.

(Exercise No. 9.)

OBJECT.—Dismounted collective fire for cavalry against superior hostile cavalry.

SITUATION.—A platoon, while reconnoitering, is driven back by two troops, gallops to suitable cover, dismounts, and holds the enemy by fire action.

ACTION.—Scouts report a considerable body of the enemy's cavalry approaching. At revolver fire the platoon retires at the gallop to ground suitable for fire action, and the scouts, clearing the front, take up a position to watch the flanks. The platoon dismounts, the led horses are placed under cover, and three minutes after the revolver shot the target appears in front at a distance of about 800 yards and moves rapidly by the flank for 200 yards. The leader opens fire and continues firing until the target stops or disappears.

TARGET.—Target L.

AMMUNITION.—Five rounds per man.

NOTE.—If practicable, the E silhouette should be replaced on the sled target by three or more targets R.

(Exercise No. 10.)

OBJECT.—Dismounted collective fire for two or more troops of cavalry, illustrating mutual support in retirement.

SITUATION.—Two or more troops of cavalry are forced back by superior infantry. The troops take up successive fire positions and mount and retire alternately at the gallop. The targets are so placed that they appear on the front and flanks and represent an enemy following the retirement.

ACTION.—At revolver fire, the troops being mounted, the first target appears, remains in sight one minute, and disappears. The troops are dismounted, the led horses retired to shelter, the dismounted troops form line of skirmishers and open fire.

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When the first target disappears one troop withdraws from the firing line, mounts, and gallops to a position in rear, from which fire can be returned.

Three minutes after the first target disappears the second target appears and remains in sight one minute, when it disappears. In the same manner and with the same intervals other targets appear and disappear. As soon as the retiring troop opens fire the remainder of the firing line mounts and retires at a gallop. The first target will be between 600 and 800 yards from the firing line. The other targets will be placed as the surface of the ground may indicate.

TARGETS.—Three or more targets I, of 16 figures each.

AMMUNITION.—Not to exceed 10 rounds per man.

NOTE.—The retiring troop should, if the nature of the ground will permit, retire to a flank, so as to avoid having their fire masked by the remaining troops when retiring.

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PART V.

REVOLVER PRACTICE.

CHAPTER I.

PRELIMINARY DRILLS.

195. NOMENCLATURE AND CARE OF THE REVOLVER; HANDLING AND PRECAUTIONS AGAINST ACCIDENTS.—The soldier will first be taught the nomenclature of those parts of the revolver necessary to an understanding of its action and use and the proper measures for its care and preservation.

The description of the Colt's revolver, caliber .38 (Ordnance Publication No. 1919), contains full information on this subject and is furnished to organizations armed with the revolver.

Careless handling of the revolver is the cause of many accidents and results in broken parts of the mechanism. The following rules will, if followed, prevent much trouble of this character:

(*a*) When taking the revolver from the armrack, and before returning it to the same, open the cylinder and eject empty shells and cartridges. Before beginning a drill and upon arriving on the range observe the same precaution.

(*b*) Never cock the revolver until the moment of firing.

(*c*) Always keep the revolver in the position of "Raise pistol" (par. 156, "Cavalry Drill Regulations"), except when it is pointed at the target. (The position of "Lower pistol" is authorized for mounted firing only.) Never place the revolver upon the ground where sand or earth can enter the bore.

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(*d*) Return to "Raise pistol" after each shot, except in rapid fire.

(*e*) In cocking the revolver, and after each shot using double action, release all pressure upon the trigger.

(*f*) Before loading the revolver open the cylinder and look through the bore to see that it is free from obstruction. In loading, place five cartridges in the cylinder and let the hammer down *on the empty chamber.*

(*g*) Never point the revolver in any direction where it would matter if it went off by accident.

196. POSITION, DISMOUNTED.—Body and head erect, the body faced slightly to the left; the right toe pointing toward the mark, the left foot about 2 inches to the rear of the right and far enough from it to assure firmness and steadiness of position (about 8 inches for the average man), toe turned out as much as is natural; weight of the body borne equally upon both feet; left arm hanging naturally.

The revolver should be grasped with the thumb and last three fingers; the forefinger is held outside of and along the trigger guard until the moment of firing; the little finger may be placed under the butt, the toe of the butt protruding between the third and fourth fingers, as this assures to many the correct method of holding the revolver.

The grasp should not be so tight as to cause tremors of the hand or arm to be communicated to the revolver, but should be firm enough to avoid losing the grip when the recoil takes place. The grip, or position and tension of the hand on the butt, is most important in revolver firing. It will be explained to the soldier that with the same aim for every shot, the point struck will depend upon the point of support of the revolver which is furnished by the hand, and that if the grip is such that the point of support is not the same, the point struck will vary with each shot.

197. SELECTING THE PROPER GRIP.—Owing to the fact that the force of recoil is in all cases with the service revolver exerted in a line above the hand which grasps the stock and takes up the recoil an upward motion is imparted to the muzzle at discharge. If the hand be placed so that the grasp is largely on one side of the stock, this rotary motion is upward and to the opposite side. If the grasp be such that the part of the hand which sustains the recoil is high on the butt and directly

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behind it, the point struck will approximate very closely the point of aim. For the majority of men such a position of the hand in firing necessitates a constrained position of the wrist and leads to poor results in rapid fire, especially when mounted. The instructor will encourage the soldier to persevere until he has secured a position of the hand with which he can hold the revolver, when pointed at the target, firmly and without constraint. Having secured this position, the soldier will be cautioned not to change it and to maintain in firing a uniform tension of grip. If the grip is uniform, the mark can be hit by selecting the proper point of aim (for the majority this will be low and to the right), but if the grip be changed at each shot very poor results will be obtained. The arm may be slightly bent or fully extended. As in mounted firing, the motion of the horse is generally communicated in an exaggerated manner to the revolver when the arm is fully extended, the former position should be selected by men who are required to fire mounted.

198. AIMING.—If the principles of aiming have not been taught, the soldier's instruction will begin with the sighting drills for the rifle prescribed in Part II. Aiming by closing one eye and looking along the sights with the other will be permitted in slow and timed fire only. In this class of firing the soldier will learn where his revolver shoots, i. e., where, with his peculiarities of hold and grip, the point struck is with reference to the point of aim, and he will be able to master the details of pointing, holding, and squeezing the trigger.

In active service few opportunities will offer for slow-aimed fire with the revolver, but use will be made of the weapon under circumstances where accurate pointing and rapid manipulation are of vital importance.

In rapid fire, while bringing the revolver to bear upon the mark, the soldier will keep his eyes fixed upon the mark and not on the sights. The great difficulty in accurate quick aiming with the revolver lies in the fact that when the front site is brought upon the mark the rear sight is often found to be outside the line joining the eye with the mark. This is more liable to occur with the revolver than with the rifle, for the reason that the revolver has no shoulder rest. This tendency to hold the revolver obliquely can only be overcome by a uniform manner of holding and pointing the revolver, and this in turn can

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only be accomplished by acquiring with practice a grip which requires no constraint of the muscles, and which can be taken with certainty each time the weapon is pointed.

It is this fact which makes the position and aiming drill so important. The soldier should constantly practice pointing the revolver with both eyes open and directed upon the mark, and he should then endeavor to hold the revolver in the position assumed while he closes one eye and looks through the sights to see what error he has made.

199. IMPORTANCE OF NOT JERKING THE TRIGGER.—The trigger squeeze of the service revolver is much more than that of the rifle. If the trigger be pulled hurriedly, or with a jerk, the force required is such that the muzzle of the revolver will probably be diverted at the moment of firing. The soldier should be entirely familiar with the trigger squeeze of his revolver in order to do good shooting. He should acquire this familiarity in the position and aiming drills, dismounted. The proper method of squeezing the trigger is by contracting all the muscles of the hand as a lemon is squeezed, not by exerting force with the trigger finger alone.

200. SELF-COCKING ACTION.—The force required to squeeze the trigger when the self-cocking device is used is considerably more than with the single action. To accustom the soldier to the use of the self-cocking mechanism, and also to strengthen and develop the muscles of the hand, a few minutes' practice daily in holding the unloaded revolver on a mark and snapping it, using the self-cocking mechanism, is recommended. The use of the self-cocking device in firing is not recommended except in emergency. By practice in cocking the revolver the soldier can become sufficiently expert to fire very rapidly, using single action, and his accuracy will be greater than when using double action.

201. HOW TO COCK THE REVOLVER.—The revolver should be cocked by putting the thumb on the hammer at as nearly a right angle to the hammer as possible, and by the action of the thumb muscles alone bringing the hammer back to the position of full cock. Some men with large hands are able to cock the revolver with the thumb while holding it in the position of aim or raise pistol. Where the soldier's hand is small this can not be done, and in this case it assists the operation to give the revolver a slight tilt to the right and upward (to the right

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and rear when at raise pistol), retaining firmly the hold on the butt with the last three fingers, taking great care to bring the revolver back to its original position in which the proper grip is resumed. Particular care should be taken that the forefinger is clear of the trigger or the cylinder will not revolve. Jerking the revolver forward while holding the thumb on the hammer will not be permitted, as it leads to many accidental discharges.

202. POSITION AND AIMING DRILLS, DISMOUNTED.—For this instruction the squad will be formed with an interval of one pace between files. Black pasters to simulate bull's-eyes will be pasted opposite each man on the barrack or other wall, the squad being 10 paces distant. The men will be instructed in taking aim at these pasters and squeezing the trigger. It is at this period that the soldier will receive the most benefit from careful individual instruction. Each soldier should be assured and encouraged in good positions or corrected in false ones.

The squad being formed as described above, the instructor gives the command: 1. *Raise.* 2. PISTOL. (Par. 156, "Cavalry Drill Regulations") and cautions, "Position and aiming drill, dismounted." The men take the position described in paragraph 196.

203. FIRST EXERCISE.—At the command "ready" the men cock the revolver as described in paragraph 201. At the command: 1. *Squad;* 2. FIRE, the men, closing one eye, will aim at a point slightly below the simulated bull's-eye and squeeze the trigger without jerk. The revolver will be held on the mark for an instant after the hammer falls, and the soldier will observe carefully what effect, if any, the squeezing of the trigger has had on his aim.

204. SECOND EXERCISE.—The instructor commands: 1. *Rapid fire;* 2. EXERCISE. At the second command the soldier cocks his revolver and points it slightly below the bull's-eye without closing either eye or looking along the sights. He then closes his left eye (the right when firing with the left hand) and looks along the sights to verify his pointing. He then squeezes the trigger as quickly as possible without deranging the aim, immediately cocks the revolver, and repeats the performance until he has gone through the motion of firing five times. After this exercise has been repeated for a few minutes, the instructor directs the men to omit verification of the pointing and endeavor

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to fire five shots in ten seconds, holding the revolver pointed toward the target and using single action. The exercise is then repeated with verification of the pointing. The objects of this exercise are to acquire facility in handling the weapon rapidly and ability to point it accurately without taking aim.

The above exercises are then repeated with the revolver in the left hand, the left side turned slightly toward the target.

205. THIRD EXERCISE.—The instructor places the squad so that the simulated bull's-eyes are in turn to the right, left, right front, left front, and right rear. With the squad in one of these positions he cautions "*Position and aiming drill, mounted.*" At this command the right foot is carried 20 inches to the right and the left hand brought to the position of the bridle hand (Par. 246, "Cavalry Drill Regulations"). Using the commands and means laid down in paragraphs 161 and 162, "Cavalry Drill Regulations," the squad will be exercised first in aiming and squeezing the trigger; second, in pointing the revolver, verifying the pointing by looking along the sights before squeezing the trigger; and third, in pointing the revolver and squeezing the trigger the instant the revolver is on the mark without verifying the aim. The exercise will be repeated for each of the positions of the simulated bull's-eye named above.

When firing to the left the pistol hand will be about opposite the left shoulder; when firing to the right or right rear, the shoulders are turned about 45° to the right; when firing to the left, the shoulders are turned about 45° to the left.

When the soldier is proficient in these exercises with the revolver in the right hand, they are repeated with the revolver in the left hand.

POSITION AND AIMING DRILL, MOUNTED.

206. PRELIMINARY TRAINING OF HORSES.—This course must necessarily be preceded by much work during the year, having for its object getting the horses accustomed to the sight of the targets and to the noise of the discharge of the revolver. A useful method of accustoming the horses to noise of discharge is to have blank cartridges fired near them while the horses are being groomed on the picket line. The horse should also be trained to the sight of the targets.

207. QUICK AIM DRILL.—The soldier must be instructed and practiced in taking rapid aim while the horse is in motion. To

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attain these ends frequent practice should be had with the revolver throughout the year when drilling on the riding track, going through the motions of aiming and firing (at will) at silhouette targets and other objects placed along the track and 5 yards from it. This practice should be conducted at a walk, trot, and gallop. In quick aimed fire at a gallop the soldier must endeavor to discharge his revolver at the moment when the horse is in the act of rising in the leap. This can best be done by holding the revolver pointed toward the targets and moving the arm up and down in unison with the motion of the horse. With the eyes fixed on the target, point the revolver just as it starts on the upward motion and squeeze the trigger. The soldier will also be taught, with dummy or blank cartridges, to eject cartridges and reload the revolver with facility at all gaits.

208. BLANK CARTRIDGE PRACTICE AT SWINGING DISKS.—After the men become fairly accustomed to aiming and snapping at the silhouette targets, blank cartridges should be used, and that the men may judge the effects of their aim, the following simple device is recommended:

CIRCULAR DISKS, ETC.—Circular disks of sheet iron, zinc, or tin 8 inches in diameter, to which a small rod has been soldered or riveted an inch above the center, will be suspended on top of posts so that they may be revolved by the blast of the revolver, which is very materially felt at 5 feet. Five of these targets should be placed 20 yards apart along the track with a barrier erected between them and the track so that the horse can not be ridden nearer than 7 feet from the targets.

209. PRELIMINARY RANGE-PRACTICE DRILLS.—The aiming and snapping exercises outlined above for the riding school will, in the target season, be extended to and amplified on the range, where a track will be laid out, as illustrated in Plate 11, with a barrier in front of each target, to preserve a uniform distance from the horse to the targets. Parallel to and at 10 yards distance from this track will be placed 5 standing silhouette figures 20 yards apart. The squad in column of troopers, with a distance between troopers of about 10 yards, will move around the track, at the walk, the trot, and the gallop, each trooper aiming and snapping his revolver at each target as he arrives opposite to it. After repeating this several times the instructor may use blank cartridges and repeat the exercise.

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210. PRACTICE AS WITH BALL CARTRIDGES.—As soon as the horses become accustomed to the targets and the shooting, the procedure used in firing ball cartridges will be followed. The troop will be formed as illustrated in Plate 11. At the proper command each trooper will move out from the right at a walk, take up the trot and gallop, and at the latter gait move along the line of targets, delivering one shot at each. He will then resume the trot and take his place on the left of the troop. The

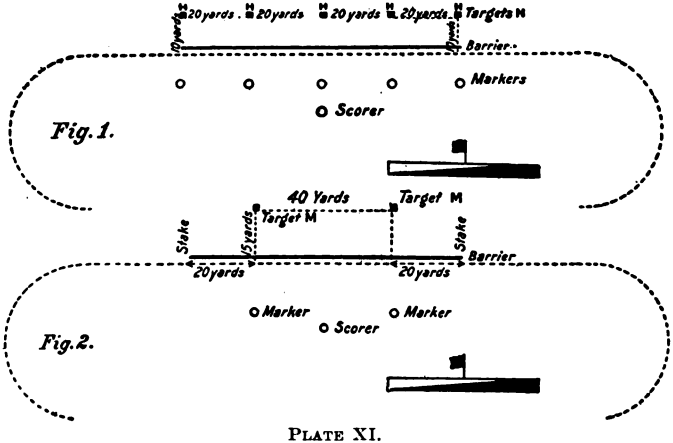

PLATE XI.

succeeding trooper will follow at such an interval, depending upon the tractability of the horses, as the troop commander deems most advisable, but preferably not moving out until the hits (if practice has been with ball cartridges) made by the preceding trooper could have been determined and the shot holes pasted, and the position of all the hits on the targets or within the frame have been shown to the trooper who has just fired.

After the troopers become skilled in the use of the revolver firing to the right, the practice will be conducted firing to the

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left; then, placing the targets obliquely to the track, the firing will be to the right front, to the left front, and to the right rear in the order stated. In firing to the left the men move out by trooper from the left, and move around the track with the targets on the left hand.

In the same manner practice will be had with blank cartridges in the procedure of rapid fire, mounted, target R, as laid down in paragraph 234. In firing to the left the left hand may be used.

CHAPTER II.

REVOLVER RANGE PRACTICE.

211. DESCRIPTION.—This practice includes the instruction of the soldier in firing with the service revolver at slow fire, timed fire, and rapid fire (dismounted course), and rapid fire (mounted course).

212. GENERAL SCHEME.—The general scheme is set forth in the following synopsis:

- Revolver range practice.
  - Dismounted course...
    - Instruction practice..
      - Slow fire.
      - Timed fire.
      - Rapid fire.
    - Record practice.....
      - Timed fire.
      - Rapid fire.
  - Mounted course .....
    - Instruction practice.. Rapid fire at five targets consisting of paper silhouette Q pasted on target B and at 5 targets Q.
    - Record practice .....
      - Rapid fire as follows:
        - 5 targets standing.
        - 5 targets mounted.
        - 2 targets mounted.

General regulations.

213. ALLOWANCE OF AMMUNITION.—The prescribed course presumes an annual allowance of service ammunition of at least 180 rounds per man for those taking the complete course and

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at least 105 per man for those taking only the dismounted course.

214. PRACTICE SEASON.—Revolver range practice will take place during the season for rifle firing (par. 86). During the supplementary season such practice as the time and allowance of ammunition will admit of will be given to recruits who have not fired the record course mounted and to others requiring it. Recruits joining within thirty days of the close of the supplementary season will be excused from the mounted firing therein.

215. WHO WILL FIRE.—The following table designates those who are required or authorized to fire at revolver-range practice and the courses to be followed:

Arm or corps.	To fire.	Course.
Cavalry	Squadron staff officers, troop officers, and all enlisted men except as noted below.[a]	Mounted and dismounted.
Field artillery	Battalion staff officers, battery officers, and all enlisted men.	Dismounted.
Infantry	Battalion staff officers, company officers, and all enlisted men armed with the revolver.	Dismounted.
Engineers, mounted	Battalion staff officers, company officers, and all enlisted men except as noted below.[a]	Mounted and dismounted.
Engineers, dismounted.	Battalion staff officers, company officers, and all enlisted men armed with the revolver.	Dismounted.
Coast artillery	Company officers and all enlisted men armed with the revolver.	Dismounted.
Staff departments, except medical Staff corps Regimental field and staff officers of cavalry, field artillery, and infantry, and field and staff officers of Coast Artillery Veterinarians Post noncommissioned staff	All officers and enlisted men authorized, but not required.	Dismounted.

neer and recruits having no previous mounted service, within preceding the mounted course, will, in the practi e the dismounted course only.

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All officers of fifteen years' commissioned or commissioned and enlisted service in the Regular Army, are authorized, but not required, to fire, taking, if mounted, the mounted and dismounted courses; if dismounted, the dismounted course.

216. EQUIPMENT.—The mounted course, instruction and record practice will be conducted in the field kit. The lanyard will be attached to the revolver, but will not be used as an aid in firing.

217. INSTRUCTION PRACTICE.—In all instruction practice the instructor, having required the soldier to fire the minimum prescribed in the tables, proceeds with such further firing as each particular case demands. The instructor uses his judgment in the distribution of ammunition, all that is saved in the instruction practice of excellent shots being used in the training of poor or inexperienced shots. Instruction practice should be in fact what its name indicates, and the methods followed, the time consumed, and the ammunition expended are, within the requirements of this manual, optional with the instructor.

218. RECORD PRACTICE.—In all record practice, both for dismounted and mounted courses, scores will be kept and the record of firing prepared as prescribed for the rifle. In timed fire, scoring will be done, as prescribed in paragraph 102.

219. ORDER OF PROCEDURE.—Revolver firing commences with instruction practice (dismounted course), and this practice is carried to completion for each soldier before proceeding to record practice (dismounted course) for that soldier. When the instruction practice (dismounted course) is completed, the soldier proceeds to record practice, same course, and follows this practice to completion in the order prescribed in the tables. The dismounted course completed, the soldier will be advanced to instruction practice (mounted course) in the order laid down in the table. When a soldier completes his instruction practice in either course he may begin record practice in that course without waiting for others less advanced. While engaged in record practice in either course he will do no other firing in that course. In record practice the trooper will use the horse regularly assigned to him. In general, the provisions of Chapter II, Part III, will regulate revolver firing, where applicable, as well as rifle firing.

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220. THE GAIT.—In all cases where the gait is a gallop, the prescribed regulation gallop is meant. The canter will not be permitted.

221. BLANK CARTRIDGES.—Exercises with blank cartridges, circling to the right, left, etc., and firing at the silhouettes on the track, should be carried on previous to firing with ball cartridges.

222. BARRIERS.—Barriers will be placed along the edge of, and parallel to, the track in front of the targets in order to preserve the prescribed distance from track to targets.

223. SYSTEMATIC INSTRUCTION.—All cavalry troops and all officers and enlisted men armed with the revolver will be instructed in its use. This instruction will be systematic and progressive, the controlling idea being accurate, rapid work.

224. NECESSITY FOR PREVIOUS INSTRUCTION IN SLOW FIRE.—Before instruction in rapid fire is commenced, slow fire should be taught. The recruit in this way will be made acquainted with the proper method of holding the revolver, of aiming and pointing and squeezing the trigger, the effect of the recoil on the trajectory, and the extent to which he must aim off the mark at the different ranges in order to make a hit. For this preliminary instruction slow fire is necessary and must be conducted dismounted. To readily measure the distance of the hits from the point aimed at, the bull's-eye target is used.

CHAPTER III.

DISMOUNTED COURSE; MOUNTED COURSE.

GENERAL REMARKS.

225. TABULATION.—For convenience of reference, the general scheme tabulated in paragraph 212 is here tabulated in detail. The tables are two in number and relate to the two divisions of the subject, viz, dismounted course and mounted course.

Each table is followed by regulations partly in explanation d partly in addition to the table itself. It will be always stood that the have the force of written regulations.

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226. *Dismounted course.*

Ranges (yards.)	Instruction practice.						Record practice.			
	Target N.				Target N.		Target N.		Target N.	
	Slow fire.		Timed fire.		Rapid fire.		Timed fire.		Rapid fire.	
	Time limit.	Scores.	Time limit for score.	Scores.	Time limit for score.	Scores.	Time limit for score.	Scores.	Time limit for score.	Scores.
15	No limit.	Minimum of one at each range.	30 seconds.	Minimum of two at each range.	10 seconds.	Minimum of two at each range.	.....	...	10 seconds.	2
25			30 seconds.		10 seconds.		30 seconds.	2	10 seconds.	2
50			30 seconds.		.....		30 seconds.	2	.....	...

SLOW FIRE.

227. Target N. (See "Targets," Chap. 1, Part VI.)

TIMED FIRE.

228. TARGET.—Target as in slow fire.

229. PROCEDURE.—Time is taken at the firing stand by sand-glass or watch. The target being up, the soldier stands with revolver at "Raise pistol." The revolver is loaded with 5 cartridges, the hammer on the empty chamber. The command "Commence firing" is given and the soldier fires 5 shots within thirty seconds, at the end of which interval the command "Cease firing" will have been given. Unfired shots count as misses.

In case of defective cartridges or disabled revolver the score is repeated. For each shot fired before the commencement or after the close of the time limit, 10 will be deducted from the score.

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RAPID FIRE.

230. TARGET.—As in slow fire.

231. PROCEDURE.—The soldier stands with revolver at "Raise pistol," revolver loaded with five cartridges, hammer on empty chamber. At a signal given at the firing point (trumpet or telephone) the target appears, remains in sight ten seconds, then disappears. The soldier attempts to fire five shots, firing at will, without command, and using self-cocking action if he desires, from the instant any portion of the target appears until it completely disappears. Each unfired cartridge counts as a miss. In case of defective cartridge or disabled revolver the score is repeated. Time is regulated at the target, the signal at the firing point being given as a warning to the officer or the noncommissioned officer in charge of the target in the pit that all is ready at the firing point for the target to appear. (See "Pit Regulations," Chap. II, Part III.)

Prior to rapid-fire practice the instructor should thoroughly drill his command in the manipulation of the revolver.

232. *Mounted course.*

Range (yards).	Instruction practice.				Record practice.					
	Paper targets Q, on B frame.		Figure targets Q.		Figure targets Q.		Figure targets R.			
							Five targets.		Two targets.	
	Gait.	Shots.	Gait.	Shots.	Gait.	Shots.	Gait.	Shots.	Gait.	Shots.
10	Gallop	Minimum of 10.	Gallop	Minimum of 25.	Gallop	25				
15							Gallop	10	Gallop	5

233. TARGETS.—For instruction practice the following targets are used, the paper silhouette Q pasted on target B in rectangular frame resting on ground facing track, and target Q. (See "Targets," Part VI.) Five targets are used and are placed 10

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yards from the track and with 20-yard intervals. At least one run to the right and one to the left, firing five shots each run, will be made on the rectangular target. Further firing on this target will be optional with the troop commander.

With the five targets Q arranged as above, firings are to the right, left, right front, left front, and right rear.

234. PROCEDURE IN INSTRUCTION PRACTICE.—The object of permitting the soldier to fire at the paper silhouette pasted on a rectangular target is that he may learn the nature of the errors which he makes in firing mounted. After each run the position of all hits within the frame will be pointed out to the soldier before the succeeding run is made. After each run at Target Q in instruction practice, the location of each hit will be pointed out to the soldier before the succeeding run is made.

235. RECORD PRACTICE.—With the targets (target Q, silhouette of standing figure) arranged as shown in figure 1, Plate II, the targets being 10 yards from the track, there are five circlings of the track at a gallop for each soldier, firing five shots in each of the prescribed directions, viz, to the right, left, right front, left front, and right rear, or 25 shots in all.

With the targets (target R, silhouette of mounted soldier) arranged as in figure 1, Plate II, the targets being 15 yards from the track, there will be two circlings for each soldier firing five shots to the right and five shots to the left, or ten shots in all.

With the targets (target R, silhouette of mounted soldier) arranged as in figure 2, Plate II, the targets being 15 yards from the track and 40 yards apart, there will be one circling of the track at a gallop, firing toward the right. Five shots will be fired, the soldier using his discretion as to what proportion of the five shots will be fired at each target. Firing will not be commenced until the trooper has arrived within 20 yards of a point opposite the first target, and will cease when he has passed 20 yards beyond the point opposite the second target. These limits will be marked by stakes.

No trooper will leave the track except at the ends. If a cartridge misses fire or the revolver fails to work, he should continue the gallop to the end of the track, replace the defective cartridge or correct the trouble with the revolver, and take his place for another run.

If through failure of a defective cartridge one or more targets are not fired upon in any run, the trooper, in repeating the

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run, will fire only on those targets at which he did not fire before.

236. METHOD OF SCORING.—A soldier will be detailed as marker for each target; he will stand in front of his target on the opposite side of the track. The targets will be lettered A, B, C, D, and E in succession from right to left, the letters being written on the targets. As a shot is fired at a target the corresponding marker will run toward it and call "Target A, Score one," or "two," or "Miss," as the case may be. He will then cover the shot hole with a paster. One noncommissioned officer (in record practice from a troop other than that firing, unless at a one-company post) is detailed as scorer. His place is opposite the center of the track. The regulations for scoring and recording scores in rifle practice will, as far as applicable, govern in revolver firing.

237. INSTRUCTIONS FOR MOUNTED REVOLVER FIRING.

(*a*) Never fire near a horse's ears or head, otherwise he may become gun shy. When firing to the right front lean well to the right, and when firing to the left front lean well to the left. Treat the horse kindly and handle him quietly, otherwise he may be made to fear firing and become unmanageable.

(*b*) Take the regulation gallop, neither a canter nor a run. Do not bring the horse to a trot until 25 yards beyond the last target.

(*c*) Fire from either a "Raise pistol," or "Lower pistol," the former is better.

(*d*) Immediately after firing a shot, cock the revolver for the next shot, unless double action is used. The best results in firing are obtained by use of the single action.

(*e*) Be sure before starting on a run, unless otherwise instructed, that the revolver is loaded with five cartridges and that the *hammer is on the empty chamber.*

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PART VI.

TARGETS AND RANGES.

CHAPTER I.

TARGETS.

238. DIVISION OF TARGETS.—The best method of determining a soldier's error in firing, and to encourage improvement, is to divide the target into various divisions and to give hits in these divisions a value constant for all points in any one space, but increasing in value in proportion to the difficulty and desirability of hitting such a place, the highest values being given, of course, to hits in the space usually called the "bull's-eye." The shape and dimensions of the bull's-eye targets adopted for individual slow fire are based on the above considerations.

When the soldier has discovered the nature of the errors, if any, which he usually commits, and has been instructed as to the best methods of avoiding them, it becomes necessary to train him in firing at figures such as he will have as targets in action. The targets for rapid and skirmish fire have, therefore, been devised with a view to the transition from the artificial bull's-eye target, by which reward in good scores is given for good grouping of shots, to the field targets where the marking is done on the hit-or-nothing principle.

In rapid fire and skirmish, therefore, the bull's-eye target is not used, but instead a silhouette representing a soldier in the prone position placed in the middle of a rectangular target. The field targets are used in preliminary training and instruction field practice and regular field practice with a view of

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obtaining objectives similar to those which will probably be met with in war. Much ingenuity can be used in the use and development of this class of target and every effort will be made to do so. The appliances described for operating field targets are a guide only, but any system which will give results may be used. Some of the targets for this class of firing can be made and kept in repair with the usual facilities for such work at any post.

239. KNOWN DISTANCE TARGETS.

TARGET A.—The short-range target, used for 200 and 300 yards, is a rectangle 6 feet high by 4 feet wide. Black circular bull's-eye 8 inches in diameter, value of hit, 5; center ring, 26 inches in diameter, value of hit, 4; inner ring, 46 inches in diameter, value of hit, 3; outer, remainder of target, value of hit, 2.

TARGET B.—The mid-range target, used for 500 and 600 yards, is a square 6 feet on a side, black circular bull's eye 20 inches in diameter; center ring, 37 inches in diameter; inner ring, 53 inches in diameter; outer, remainder of target. Value of hits, same as on target "A."

TARGET C.—The long-range target, used for 800 and 1,000 yards. It is a rectangle 6 feet high and 12 feet wide. Black circular bull's-eye 36 inches in diameter; center ring, 54 inches diameter; inner space outside of center ring bounded by vertical lines 3 feet from each end of target; outer, remainder of target. Value of hits, same as on target "A."

TARGET D.—The rapid-fire and skirmish target. A black silhouette representing a soldier in the prone position placed in the middle of a rectangular target 6 by 6 feet. Value of hits, rapid fire, in the figure, 5; in the space below the figure, 4; in the concentric space immediately outside the figure, 3; remainder of target, 2. In skirmish, only hits in the figure and in the space below it will be scored and with same value as in rapid fire.

240. FIELD TARGETS.

TARGET E.—A drab silhouette of a soldier in the kneeling position, made of bookbinder's board or other similar material.

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Hits on all field targets count 1, and any shot cutting the edge of a silhouette is a hit.

TARGET F.—A drab silhouette of a soldier in the prone position, made of bookbinder's board or other similar material.

The life of targets E and F can be materially prolonged by pasting on fresh paper silhouettes when the figure becomes too much damaged by shots. These targets are used as stationary and bobbing targets as well as on the moving and disappearing appliances. When necessary these targets are fastened to wooden staves with tacks and tin washers.

TARGET G.—Falling target. The target is made of soft wood and about the shape, size, and color of the prone silhouette F.

These targets should be placed in small pits (1 by 2 feet), so that about 9 or 10 inches of vertical protection is given the base and mechanism; only the face of the target should show to the front. If the wooden figure becomes unserviceable it may be repaired at the post.

TARGET H.—Targets E or F inserted in a slit at the end of a marking disk staff or pole and fastened with wooden pegs. On a Class A range the staffs are held in place by loops or rings on the inside of the crest of the pit. The targets are held with the edge turned to the firing point until it is to be fired at, when it is faced to the front. The target is turned rapidly several times to indicate a miss, and the white reverse side is shown to indicate a hit. The pits for operating these targets on a Class B range should be deep enough to afford cover, or they can be operated from behind sandbags. The operator should be practiced in raising and lowering the target at a given signal. It is also important that the target be raised exactly the same height above the parapet each time.

TARGET I.—Beam disappearing target. The visible target represents a line of prone or kneeling figures at suitable intervals. In close order 8 figures are mounted on each beam. The figures are targets E or F mounted on the regulation staves, which are modified by having the points cut off, so that but 6 inches project below the bottom of the figure.

The beam itself is built up of one piece of 2 by 6 inches by 20 feet long, one piece 1 by 6 inches by 20 feet long, and 1 by 6 inches by 20 inch sections fitted between them, as shown in plate. In the sockets left the staves are fitted.

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The beam is laid in a shallow trench, targets horizontal, and a stake is driven in front of the beam at each end. The ropes from the operating standard lead to the pit (direct and via the rear ring stake) and the beam is turned through 90°, exposing and lowering the targets by pulling on the appropriate ropes. The rope system is in duplicate, so that if one rope is cut by a bullet the target can still be worked. Two or more beams can be coupled together and the whole operated from the center. There should be two end stakes for each beam. The operating standard should be painted a neutral color, have earth rubbed on it or have bundles of vegetation tied to it. The ropes should also be of a neutral color.

This apparatus requires but one man for its operation, even if two beams are coupled together. The pit should be deep enough to give protection, and the earth therefrom should be spread out into a thin embankment and concealed by grass or brush.

TARGET K.—Sled target, type A. The target proper consists of a line of E or F targets. Six or more of these in close order are fastened to the beam. The sled frame is constructed of wood and the runners shod with iron broad enough to give a good grip on the ground. A rope from 200 to 300 yards is used to pull this target, and an escort wagon and team has been found to be the best motive power. The rope can be run through a snatch block and the team concealed by inequalities in the ground.

In use the sled should be taken to the starting point, targets inserted and laid flat to the rear by turning the beam, and the whole sled concealed by grass, brush, etc. If desired a line of targets "F" may be attached to the beam at right angle to the targets "E." (See Plates XVII and XVIII.) The rope is run out over the course to be taken by the sled and the other end fastened to the wagon. When the wagon starts the strain comes on the raising wire and the targets come up with a snap as the sled moves off.

This type of sled can only be used (with the raising device) for frontal or nearly frontal movement. However, if a flank movement is desired and a sled of type B is not available, the beam may be taken out of the socket-bearings and lashed fore and aft on the sled.

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TARGET L.—Sled target, type B. The disappearing target-beam (Target I, plate 15) is lashed lengthwise to two sleds of target K type. A long rope and escort wagon and team are used with this sled as with type A. (See Plate XIX.)

If no cover can be found for hiding the sled before it starts, it can be easily masked with brush, grass, etc., which will fall when the targets start.

TARGET M.—This target rolls on a track placed at right angles to the range.

It consists of:

(*a*) A car carrying one or more targets E. (If more than one target E is placed on the car they will be not less than 3 yards between centers.)

(*b*) A wooden rail 2 by 4 inches, not less than 12 feet long, placed longitudinally on the car to which the stake of the target E is fastened by small nails in such manner that the bottom of the target E rests on the rail.

(*c*) At least 55 yards of track.

The car frame is strongly made of seasoned clear pine, dressed and painted. The wheels are wrought iron, firmly fixed on a wrought-iron axle, in the same manner that railroad wheels are set on their axles. The bearings are cast-iron boxes fastened underneath the side rails of the car and are oiled through a hole in the side rail. The car is made long enough to carry a 12-foot rail which rests on the end cross rails of the car.

The track frame is strongly made of seasoned clear pine, dressed and painted; the rail, which weighs 8 pounds per yard, is firmly spiked to the frame, and both ends supplied with fish plates for connecting together different lengths of track. Each piece of track is made 14 feet long and complete weighs 165 pounds.

The track should be sunk in a pit deep enough to protect it and the car; that is, so that the top of the longitudinal rail which the car carries will be even with the surface of the ground.

A shelter of sufficient size to screen the target from view is erected at each end of the track.

A light rope 60 yards or more in length is attached to each end of the car and is used to draw it from one shelter to the other across the range. These ropes may be run through pul-

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leys and wound around drums, which are operated by men behind shelter or they may be pulled by men walking in a continuous shelter, where such exists.

A stake should be placed at each end of the track to stop the car and prevent it from running off the track.

If the width of the range permits and the amount of firing renders it desirable, two tracks and cars may be provided.

The target is marked with the B target disk. The white disk placed on the target indicates a hit. The staff held horizontally and revolved two or three times indicates a miss.

While the record firing at moving targets prescribed herein is at target E, mounted as described above, other targets can be mounted on the car for such additional firing as time and the ammunition available will permit and the officer conducting the firing may deem desirable.

241. REVOLVER RANGE TARGETS.

TARGET N.—A rectangle 6 feet high and 4 feet wide, with black circular bull's-eye 5 inches in diameter. Value of hit therein, 10. Seven (7) rings with diameters as follows:

	Value of hit.
(1) 8½ inches	9
(2) 12 inches	8
(3) 15½ inches	7
(4) 19 inches	6
(5) 22½ inches	5
(6) 26 inches	4
(7) 46 inches	3
(8) Outer, remainder of target	2

TARGET Q.—A steel skeleton frame representing a soldier in the standing position, covered with cloth and with black paper cut as a silhouette to the shape of the frame. A horizontal line is drawn across this target at the crotch. Hits above this line are scored 2, below the line 1.

TARGET R.—A skeleton steel frame representing a soldier mounted, covered with cloth and with black paper cut as a silhouette to the shape of the frame. Hits in the black silhouette only, count. Value of hits, direct or ricochet, above

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horizontal line drawn across the target from the lowest point of the horse's head, 2; those below that line, 1.

In targets Q and R only hits on the paper silhouette will be scored.

242. MINIATURE TARGETS.

TARGET X.—Used in special course B and in gallery practice. Is a rectangular paper target 8 by 12 inches. Black circular bull's-eye, $1\frac{1}{3}$ inches diameter; center ring, $4\frac{1}{3}$ inches diameter; inner ring, $7\frac{2}{3}$ inches diameter; outer, remainder of target. Value of hits same as on target A.

TARGET Y.—Used in special course B. Is a rectangular paper target, 4 by 6 inches. Black circular bull's-eye two-thirds inch diameter; center ring, $2\frac{1}{16}$ inches diameter; inner ring, $3\frac{5}{16}$ inches diameter; outer, remainder of target. Value of hits same as on target A.

TARGET Z.—Used in special course B. Is a rectangular paper target, $2\frac{2}{3}$ by 4 inches. Black circular bull's-eye four-ninths inch diameter; center ring, $1\frac{1}{3}$ inches diameter; inner ring, $2\frac{2}{3}$ inches diameter; outer, remainder of target. Value of hits same as on target A.

A ricochet has the same value as a direct hit on all targets.

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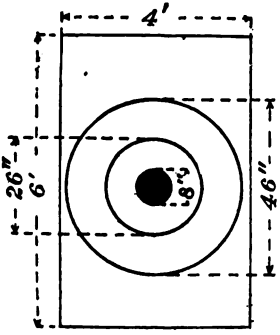
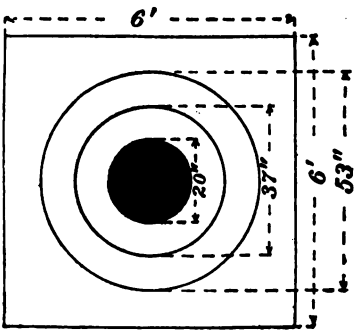
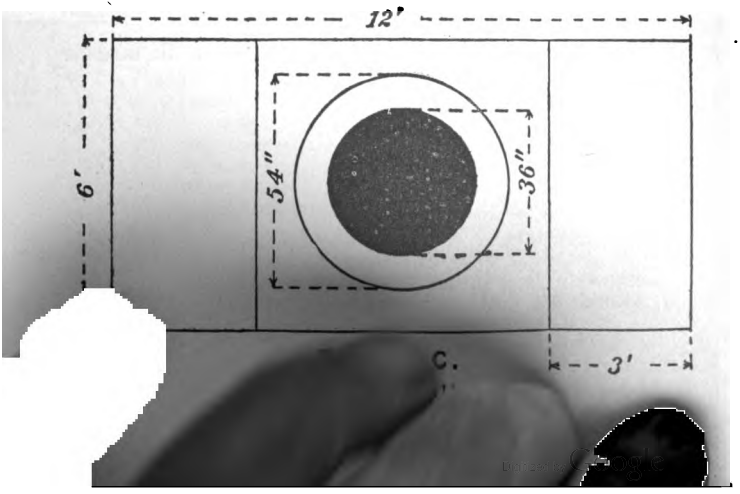
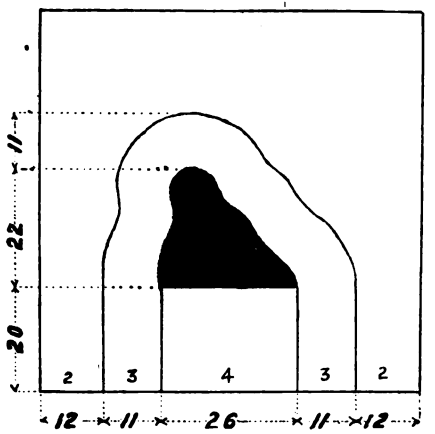


TARGET A.

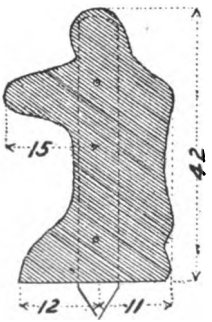


TARGET B.

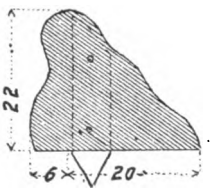




TARGET D.



TARGET E.



TARGET F.

PLATE XIII.

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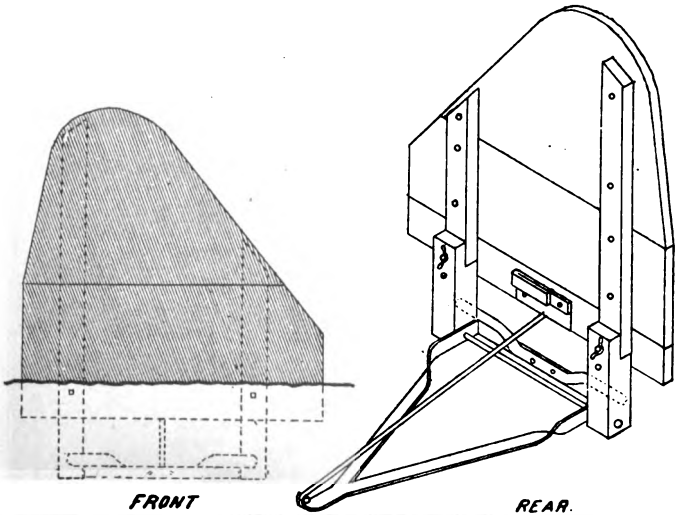

TARGET G, AHRENDS TYPE.

PLATE XIV.

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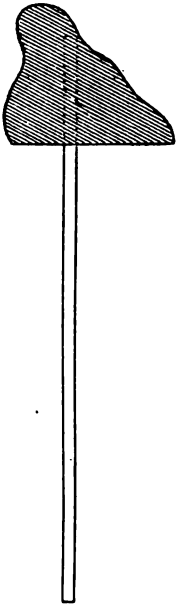
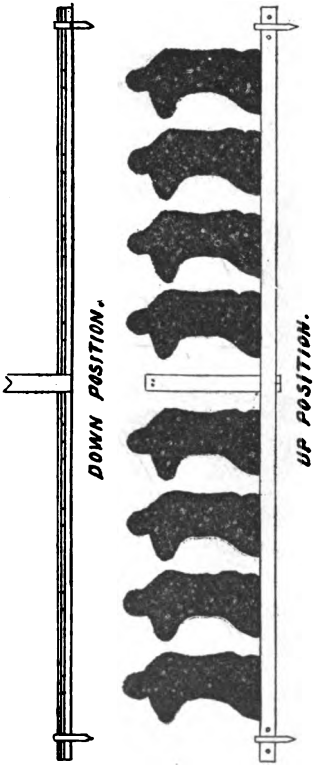


TARGET H.



TARGET I.
PLATE XV.

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TARGET 1, DETAIL.

PLATE XVI.

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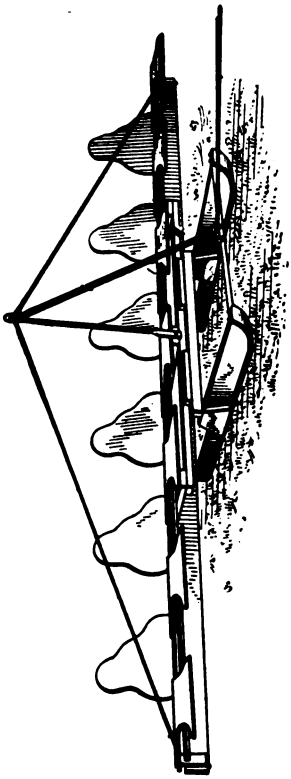

PLATE XVII.

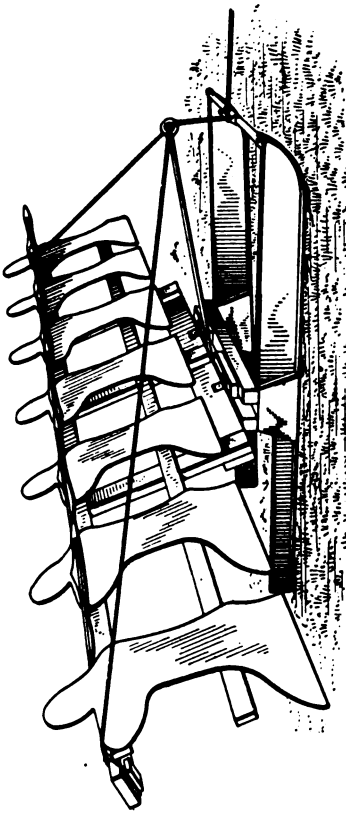

PLATE XVIII.

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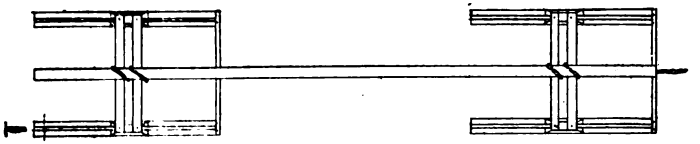
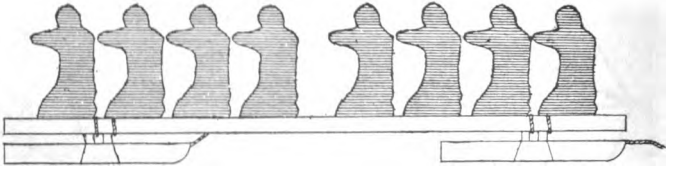
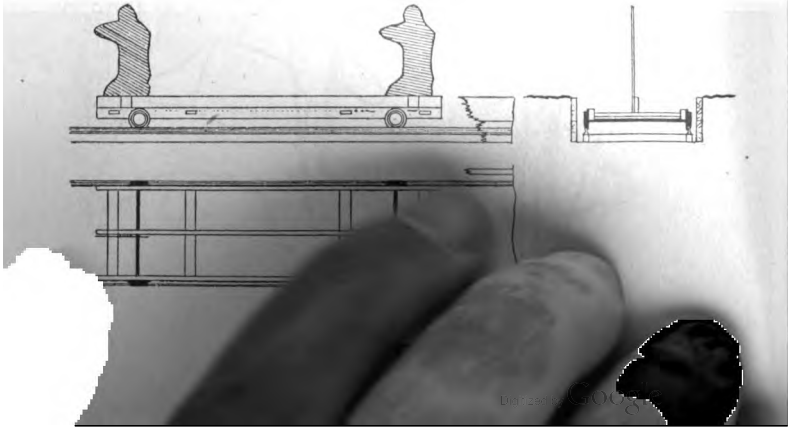
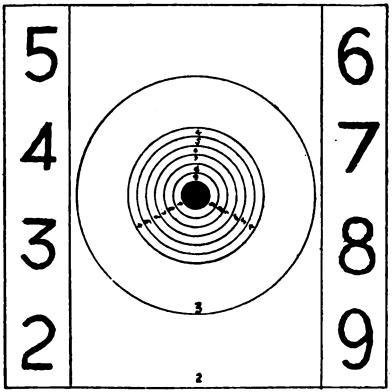




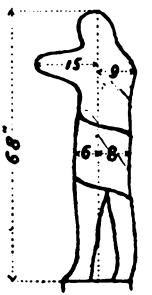
TARGET L.

PLATE XIX.

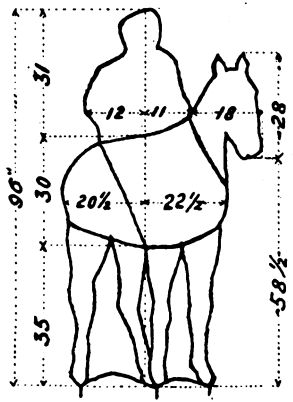




TARGET N.



TARGET Q.



TARGET R.

PLATE XXI.

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CHAPTER II.

RANGES.

243. CLASSES.—There are two classes of ranges: A, ranges which are more or less limited in extent and equipped for known-distance practice; B, ranges of an extended area and diversified terrain over which field practice is held.

CLASS A RANGES.

244. RULES FOR SELECTION.—As the nature and extent of the ground available for target practice and also the general climatic conditions are often widely dissimilar for different military posts, it will not be possible to prescribe any particular rules governing the selection of ranges, but only to express certain general conditions to which ranges should be made to conform as far as may be practicable. In view of the extreme range and penetration of the bullet of the United States rifle, model 1903, it will be found necessary in the case of many posts to have target practice conducted at a distance of several miles from the post, necessitating the establishment of a camp on or near the range. The target practice can then be conducted uninterrupted by the routine post duties.

245. SECURITY NECESSARY.—For posts situated in thickly settled localities where the extent of the military reservation is limited, the first condition to be fulfilled is that of security for those living or laboring near or passing by the range. This requirement can be secured for Class A range by selecting ground where a natural butt is available or by making an artificial butt sufficiently extensive to stop wild shots. For complete security there should be no road, building, or cultivated ground on either flank of the range nearer than 300 yards, nor in the rear of it within the extreme range of the rifle. This condition can rarely be secured unless a natural butt of large extent exists.

246. DIRECTION OF RANGE.—The direction of a Class A range with reference to the points of the compass should be determined, as far as practicable, from a consideration of the time most favorable for practice, the direction of the prevailing winds, and the direction of the sun.

247. BEST TIME FOR KNOWN-DISTANCE PRACTICE.—It is desir- (if the weather is generally favorable at that hour) to

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hold the practice in the morning, for then the soldier will not have been fatigued by the day's drill or labor. This latter condition and the position of the sun points to the selection of ground where the targets can be to the north or west of the firing point, the soldier will then have the sun behind his back or at one side, and never in his eyes; and the light on the targets will be uniform and not broken by the shadow of the markers' shelters.

248. BEST GROUND FOR CLASS A RANGE.—Smooth, level ground, or ground with only a very moderate slope, is best adapted for a range. If possible, the targets should be on the natural surface of the ground on the same level with the firer, or only slightly above him. Firing down hill should, if practicable, be avoided.

249. EXTENT OF RANGE.—Important conditions require that the distance from the soldiers' barrack or camp to the range should not be excessive, and that the range should be sufficiently extensive to permit firng up to at least 1,000 yards.

250. INTERVAL BETWEEN TARGETS.—To reduce to a minimum the amount of labor required in preparing the butt and ground, the targets should be no farther apart than is necessary to obviate the probability of a shot being fired on the wrong target. Fifteen yards between centers of targets will be found a good distance to fulfill this condition. (See plate 22.)

251. CONTINUOUS SHELTERS.—For targets which slide vertically, if placed with this interval, the markers' shelter should be continuous, extending also in front of the space between the targets; this will afford all the markers complete shelter and will permit those at any target to be relieved or communicated with, without compelling a cessation of any firing.

252. SEPARATE SHELTERS.—Where it is not practicable to make the markers' shelter continuous, the targets should be arranged in pairs, with intervals of 6 to 10 yards between the targets, and about 50 yards between the pairs. Or, if the breadth of the range is not limited, the targets should be arranged singly and about 50 yards apart; each special range will then be entirely independent of those adjacent.

253. ARTIFICIAL BUTTS.—If an artificial butt is constructed, it should be made of earth, be not less than 20 feet in height (higher if practicable), and should not have a more gradual

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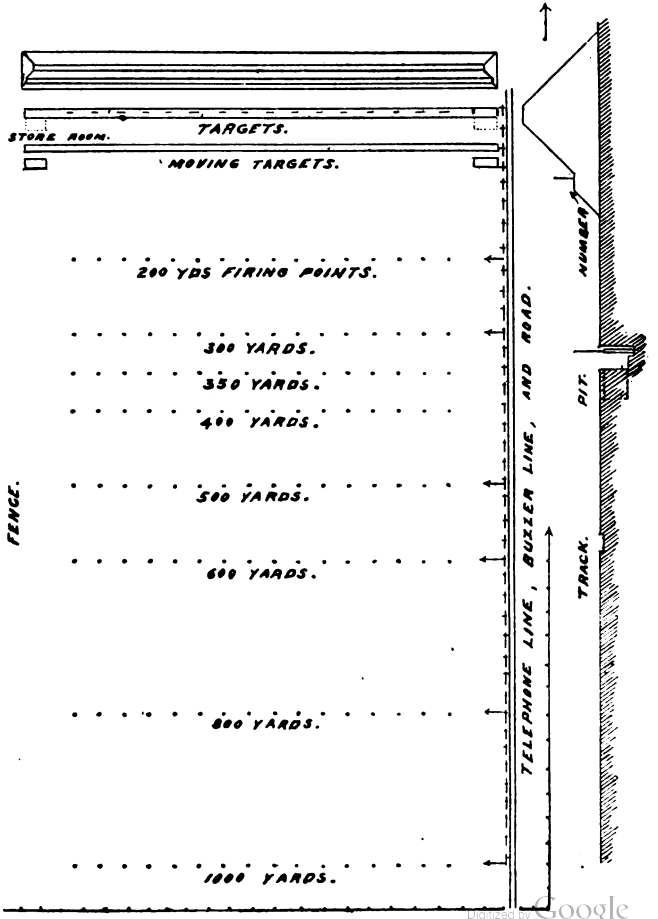

PLATE XXII.

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slope than 45°; this will compel a width at the base of about 15 yards. Nearly all the shots will bury in the lower portion of the butt, which from time to time will therefore require repairs. The butt should extend at the summit about 5 yards beyond the outside targets; it should be sodded on top, and sown with grass on the slopes.

254. HILLS AS BUTTS.—For a natural hill to form an effective butt, it should have a slope of not less than 45°; if originally more gradual it should be cut into steps the face of each step having that slope. For a temporary expedient the face of the hill may be plowed perpendicularly to the range, but as the bullets soon cut down the furrows, this measure must be frequently repeated to prevent the danger of ricochets.

255. NUMBERING OF TARGETS.—Each target should be designated by a number; those for ranges up to 600 yards in length should not be less than 6 feet in height and should be painted white on a black background. The Arabic is preferable to the Roman notation, being more readily comprehended by the soldier; if made of the size suggested, they will always be quickly recognized. They should be placed on the butt behind each target, but not so far above as to prevent the soldier seeing the number when aiming at the target.

256. MEASURING THE RANGE.—The range should be carefully measured and marked with stakes at each 100 yards in front of each target. The stakes should be about 12 inches above the ground, painted white, and lettered in black, with the number of the corresponding target and its distance. These stakes will then designate the firing points for each target at the different distances. Particular care should be taken that each range thus marked out is perpendicular to the face of its own target.

257. FIRING MOUNDS.—If, on account of low ground, it becomes necessary to raise any firing point, a low mound of earth, no higher than is absolutely required, should be made; the mound should be about 8 feet square and carefully smoothed and sodded.

258. RANGES PARALLEL.—The different ranges for the same distance should all be parallel, so that similar conditions with respect to wind and light may exist.

It is not essential, however, that the ranges employed for long-distance shooting should be parallel to those used for the ordinary company practice at distances 600 yards or less.

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259. PIT SHED.—A small house or shed should be built in or near the target pit, in which the marking disks and signal flags and spare parts of the target frames for making immediate repairs should be stored. It should be sufficiently large to afford a shelter for the markers in case of a sudden storm.

260. DANGER SIGNALS.—A socket for the staff of the danger signals should be placed on the marker's shelter in front of each target, and so inclined that the flag will always fall clear of the staff and be readily seen. This flag will always be displayed when the target is in place and not in use. In addition to the danger signals at the targets, one or more danger signals will be displayed near the range to warn passers-by when firing is in progress. These signals will not be placed in such a position as to serve as streamers for judging wind on the range. They should be placed on the roads or on the crest of a hill where they can be plainly seen by those passing.

261. RANGE HOUSE.—On large ranges where competitive firing is held, a house containing a storeroom and several office rooms should be erected in some central place, off the range but in its immediate vicinity. Such facilities as will enable visitors to satisfactorily witness the firing should also be provided.

262. TELEPHONE SERVICE.—When practicable, ranges should be equipped with a telephone system, connecting the target pit with each firing point, the range house, and the post. When a large number of targets are installed, the range should be equipped with the annunciator buzzer system.

263. CLASS B RANGE.—Certain extensive reservations in the United States and the Philippine Islands will furnish ample and suitable ground for field firing. At times extensive tracts of unoccupied land or land from which the crops have been harvested can be rented near the post. At other points where leased tracts are at the disposal of the garrison for purposes of target practice or maneuvers, facilities for field firing can probably be found. Any ground suitable for maneuvers will also be suitable for field firing, if the safety of the neighboring inhabitants be taken into consideration and provided for.

Class B ranges should be changed as little as possible and be allowed to remain in their natural state. Any changes made to facilitate the practice should be such as to avoid assistance to the firers.

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PART VII.

COMPETITIONS.

264. The competition was instituted and exists for the purpose of fostering interest in target practice, of furnishing the means for the exchange of ideas among those who excel in small-arms firing, and for classifying the best shots according to merit shown under similar conditions. In each alternate year there will be four competitions, as follows:

1. The departmental rifle competition;
2. The army rifle competition;
3. The departmental revolver competition;
4. The army revolver competition.

Competitions will be held at such places and times as may be designated in orders from the War Department.

CHAPTER I.

RIFLE AND REVOLVER COMPETITIONS; THE DEPARTMENTAL RIFLE COMPETITION.

265. SELECTION OF COMPETITORS.

(*a*) Enlisted men: The commanding officer of each company of infantry and engineers and each troop of cavalry will select from the enlisted men of his company or troop the most suitable soldier, due regard being paid not only to the excellence of shooting, but to steadiness and good soldierly habits and conduct, and report the name of the man thus chosen to the post

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commander, who will send him to the place of competition on the date fixed by the department commander. The post, regimental and battalion noncommissioned staff will not be represented. Enlisted men of the Coast Artillery will be permitted, but will not be required, to compete, and will be selected by company commanders as in the case of infantry organizations. The selection will be reported through proper military channels to the department commander, who will take such action as he deems proper.

(*b*) Officers: Each post commander will report to department headquarters the names of any commissioned officers, except medical officers, in his command who may desire to enter the competition and whom he can recommend for that purpose; further stating, whenever more than one officer is recommended, the comparative proficiency as rifle shots of those reported. From these reports, or from such additional reports of scores actually made as the department commander may require, he will select one officer as competitor from each regiment of infantry or cavalry and one from each battalion of engineers in his command, and in addition such officers from the general staff and the different staff departments as he deems proper. In case a regiment is divided between two or more departments, the final selection of officers therefrom will be with the War Department. The Coast Artillery may be represented at the discretion of the department commander, such representation to be based on the ratio of one officer to twelve companies.

266. ASSEMBLY.—The officers and enlisted men thus selected will be assembled at some convenient place each alternate year, and after the completion of the preliminary practice the enlisted men will compete for places on the departmental team. The officers will also compete at the same time with each other, not for places on the team, but for medals. In this competition the firing will be slow fire, rapid fire, and skirmish fire, and the composition of the team determined by the aggregate of the scores for all of those classes of firing.

267. PRELIMINARY PRACTICE.—The preliminary practice will consist, for each competitor, of the record practice, marksman's course, except skirmish fire, as prescribed in this manual and subject to regulations governing competitions, and in addition

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thereto ten rounds rapid fire at 500 yards in accordance with the regulations governing the sharpshooter's course. In rapid fire at 200 yards the bayonet will not be fixed.

There will be one run, skirmish fire, which will be conducted and penalties imposed as prescribed in the marksman's course (par. 140), except that 30 rounds of ammunition per man are issued; and the commands for firing will be those prescribed in the "Infantry Drill Regulations" for "Fire with counted cartridges." Each skirmisher fires five rounds at each halt. A defective cartridge counts as one shot and will not be replaced. When more than five hits are found in a target at any one halt the target will be withdrawn and the competitor will make another complete run. Pieces will be loaded only from the clip, a full clip being always used.

The order of sequence of the various classes of fire (slow, rapid, and skirmish fire) will be determined by the officer in charge of the competition, the controlling feature of whatever programme adopted being to secure as nearly as possible equal conditions of firing for all the competitors.

268. COMPETITION PROPER.—The classes of fire in the competition proper will be the same as prescribed in the preliminary practice, except in the number of scores and skirmish runs, which will be doubled, and all subject to regulations governing competitions.

The order of sequence of the various classes of fire (slow, rapid, and skirmish fire) will be determined, as in the preliminary practice.

269. DEPARTMENTAL TEAM.—The strength of the team will be in direct proportion to the number of enlisted competitors engaged in the competition, the ratio being fixed at one member of the team to five competitors, fractions not considered. Thus, from 75 competitors will be constituted a team of 15 members; from 100, 101, 102, 103, or 104 competitors a team of 20 members; from 105 competitors a team of 21 members, and so on. The personnel of the team will be composed of those enlisted competitors making the highest aggregate scores for the entire competition proper.

270. PRIZES.—To the members of the teams thus selected the following gold, silver, and bronze medals will be awarded,

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according to order of merit, and in the ratios indicated in the following table:

Number composing team.	Gold medals.	Silver medals.	Bronze medals.
6 or less	1	1	One to each remaining member of the team.
7 to 9, inclusive	1	2	
10 to 12, inclusive	1	3	
13 to 15, inclusive	2	3	
16 to 18, inclusive	2	4	
19 to 21, inclusive	2	5	
22 to 24, inclusive	2	6	
25 to 27, inclusive	3	6	
28 to 30, inclusive	3	7	
31 to 33, inclusive	3	8	
34 to 36, inclusive	3	9	
37 to 39, inclusive	4	9	
40 to 42, inclusive	4	10	
43 to 45, inclusive	4	11	
46 to 48, inclusive	4	12	
49 to 51, inclusive	5	12	

And so on, according to the principle illustrated in the above table.

Any commissioned competitor making a score exceeding by 5 per centum or more that of any enlisted member of the team will receive a medal like that awarded to such member.

The winners of these medals will not part with them without authority from the War Department, but will preserve them, subject to inspection at any time.

271. PRESENTATION OF PRIZES.—The presentation of competition prizes will be made, when practicable, at the conclusion of the contest, and will be conducted with the ceremony and formality warranted by the importance of the occasion. Timely requisition should be made for the prizes required.

THE ARMY RIFLE COMPETITION.

272. SELECTION OF COMPETITORS.—Each year in which departmental competitions are held there will be assembled, at such time and place as may be designated by the War Department, competitors for the army rifle team. The competitors

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will consist of the medal winners at the several departmental rifle competitions, and in addition any distinguished marksmen whose scores at the departmental rifle competition exceeded by 5 per centum or more that of the lowest member of the team in the same competition. In order to afford opportunity to distinguished marksmen to compete for the army team, each department commander will cause those distinguished marksmen within his command who have won a medal in the last competition attended by them, and who desire to compete, to attend the departmental competition, firing thereat in the usual manner during preliminary practice and competition. The scores that they make in the latter firing will be graded among those of all the competitors in order of merit, though they can not win a medal or a place on the departmental team.

273. PROCEDURE.—The army rifle competition, as regards the preliminary practice, the competitive firing, and the determination of the personnel, twelve in number, of the army rifle team, will be conducted in the manner prescribed for the departmental rifle competition.

274. PRIZES.—To the members of the army rifle team, in the order determined by this competition, the following prizes will be awarded: To the first four members of the team, gold medals; to the remaining eight members of the team, silver medals.

The commissioned competitors will be awarded medals in the same manner as at departmental competitions.

THE DEPARTMENTAL REVOLVER COMPETITION.

275. DESCRIPTION.—Each alternate year representatives of the service using the revolver, apportioned as below, will be assembled for departmental competitions with that arm.

The places for holding these competitions will be selected preferably from those at which departmental rifle competitions are held, and the dates will, if practicable, immediately precede or follow the dates for the rifle competitions.

276. SELECTION OF COMPETITORS.

(*a*) Enlisted men: The commanding officer of each troop of cavalry and each battery of field artillery will select from the

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enlisted men of his organization the most suitable soldier, due regard being paid not only to the excellence of shooting with the revolver, but to steadiness and good soldierly habits and conduct, and report the name of the man thus chosen to the post commander, who will send him to the place of competition on the date fixed in orders.

Enlisted men of infantry, engineers, and coast artillery, armed with the revolver, may be represented as follows, viz:

Infantry: Two competitors from each regiment, to be selected by the regimental commander.

Engineers: One competitor from each battalion, to be selected by the battalion commander.

Coast artillery: In the ratio of one competitor to four companies, to be selected by the department commander.

The post, regimental and battalion noncommissioned staff will not be represented.

(*b*) Officers: Each post commander will report to department headquarters the names of any commissioned officers of cavalry, infantry, and field artillery in his command who may desire to enter the competition, and whom he can recommend for that purpose, further stating, whenever more than one officer is recommended from the same regiment, the comparative proficiency as revolver shots of those reported.

From these reports, or from such additional reports of scores actually made as the department commander may require, he will select one officer as competitor from each regiment of cavalry, infantry, and field artillery in his command, one from each battalion of engineers, and, in addition, such officers, except medical officers, from the division and department staff as he may deem proper. In case a regiment is divided between two or more departments, the final selection of an officer therefrom will lie with the War Department. The coast artillery may be represented at the discretion of the department commander, such representation to be based on the ratio of one officer to twelve companies.

Other officers may be selected and reported to the War Department, as follows:

By the Chief of Engineers, one officer from among the three battalions of engineers.

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By the Chief of Coast Artillery, ten officers from the coast artillery.

Besides the above, a total of five officers from the General Staff Corps and staff departments except the Medical Corps, may be selected by the War Department.

277. ASSEMBLY.—The officers and enlisted men thus selected will be assembled at times and places designated and, after the completion of the preliminary practice, will compete for places on the departmental teams. The number of members and the personnel composing the teams will be determined as in rifle competition.

278. PRELIMINARY PRACTICE.—The preliminary practice will consist, for each competitor, of the following practice, dismounted, viz, two scores, slow fire, with a time limit of thirty seconds per shot, at each of the ranges 50 and 75 yards; two scores, timed fire, with a time limit of thirty seconds per score, 25 and 50 yards, at target N; and two scores, rapid fire, with a time limit of ten seconds per score, at each of the ranges 15 and 25 yards, at the disappearing target N.

279. PROCEDURE.—The procedure in all classes of firing will be as prescribed in dismounted course in this manual, and subject to regulations governing competitions.

280. COMPETITION PROPER.—The competition proper will be held on two consecutive days, and will consist, for each competitor, of the firing prescribed for preliminary practice, except that the course will be fired through twice, and the total number of scores will be, at each range for each class of fire, four instead of two. The order of sequence of the classes of fire (slow, timed, or rapid) will be determined by the officer in charge of the competition, the ruling feature of whatever programme adopted being to secure as nearly as possible equal conditions of firing for all competitors.

281. DEPARTMENTAL TEAM.—The number of members and the personnel composing the teams will be determined as in the rifle competitions.

282. PRIZES.—To the members of the teams thus selected the following gold, silver, and bronze medals will be awarded according to order of merit and in the ratios indicated in the following table:

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Number composing team.	Gold medals.	Silver medals.	Bronze medals.
6 or less	1	1	One to each remaining member of the team.
7 to 9, inclusive	1	2	
10 to 12, inclusive	1	3	
13 to 15, inclusive	2	3	
16 to 18, inclusive	2	4	
19 to 21, inclusive	2	5	
22 to 24, inclusive	2	6	
25 to 27, inclusive	3	6	

And so on according to the principle illustrated in above table.

Any commissioned competitor making a score equal to or greater than that of any enlisted member of the team, will receive a medal like that awarded to such member.

The winners of these medals will not part with them without authority from the War Department, but will preserve them, subject to inspection at any time.

The winner of a gold medal in any authorized competition may, if he so elects, receive in lieu thereof a revolver of special design and superior workmanship, provided with the most improved sights, which will become his personal property, but which will not be used in competitions with men using the service revolver.

THE ARMY REVOLVER COMPETITION.

283. SELECTION OF COMPETITORS.—Each year in which the departmental competitions are held there will be assembled, at such time and place as may be designated by the War Department, competitors for the army revolver team. The competitors will consist of the members of the several departmental revolver teams, and in addition any distinguished revolver shots desiring to compete whose scores at the last departmental revolver competition equaled or exceeded that of the lowest member of the team in the same competition. In order to afford opportunity to distinguished revolver shots to compete for the army team, each department commander will cause those officers and enlisted men of the class of distinguished revolver shots who desire to compete and who have won a medal in the

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last competition in which they may have fired to attend the departmental competition, firing thereat, in the usual manner, during preliminary practice and competition. The scores that they make in the latter firing will be graded among those of all the competitors in order of their merit, though they can not win a medal or a place on the team.

284. PROCEDURE.—The army revolver competition, as regards the preliminary practice, the competitive firing, and the determination of the personnel, twelve in number, of the army revolver team, will be conducted in the manner prescribed for the departmental revolver competition.

285. PRIZES.—To the members of the army revolver team in the order determined by this competition, the following prizes will be awarded: To the first four members of the team, gold medals; to the remaining eight members of the team, silver medals.

Medals will be awarded to the commissioned competitors in the same manner as at departmental revolver competitions.

CHAPTER II.

REGULATIONS.

OFFICER IN CHARGE AND ASSISTANTS.

286. OFFICER IN CHARGE.—This class of firing will be under the general control of an officer of experience, assisted by such range officers and statistical officers as may be required. The officer in charge will prescribe the hours for any preliminary practice and for matches and competitions. He will also have a general control of the range and of its police and government during the firing.

287. RANGE OFFICERS.—The range officers will supervise, in the target pit, the marking and, at the firing point, the scoring of the shots. They will also see that the competitors take, in firing, the prescribed positions, and that the squads at the different firing points preserve order and conform to the regulations of the range. One range officer will generally be required in the target pit to every two targets, and on the range an equal ratio to the firing points.

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During skirmish fire a range officer, mounted, should supervise the firing of each two of the competitors, and a noncommissioned officer will follow each competitor to keep record of the shots fired and prevent their being delivered at a wrong target. Penalties will be imposed as provided in paragraph 140 by the range officer in charge of the competitor. At the close of each run each range officer will turn in a record of the penalties imposed by him.

288. STATISTICAL OFFICER.—The statistical officer will assign the competitors to targets and to order of firing. He will verify the additions of the scores as reported by the scorekeepers, grade them in order of excellence, and prepare the results for official announcement.

MARKING, SCORING, AND SIGNALING.

289. SIGNALING AND RECORDING HITS.—Hits in the different divisions of the targets, misses, and ricochets, slow, timed, and rapid fire, will be signaled and recorded as prescribed in this manual.

290. SIGNALING MISSES.—In slow fire, before any miss is signaled, the target must be withdrawn from the firing position and carefully examined by a range officer. Whenever the target is reversed and a miss then signaled, it will be presumed that this examination has been thoroughly made, and no challenge of the value signaled will be entertained, or resignaling of the shot allowed.

291. SCORING IN SKIRMISH FIRE.—In skirmish fire, the scoring will be done as provided in paragraph 103, record practice. The score sheets will be turned in to the chief range officer.

292. ACCIDENTAL DISCHARGE.—All shots fired by the soldier after he has taken his place at the firing point, and it is his turn to fire—the target being ready—will be considered in his score, even if his piece is not directed toward the target, or is accidentally discharged.

293. FIRING ON WRONG TARGET.—Shots fired upon the wrong target will be entered upon the score of the man firing as a miss, no matter what the value of the hit upon the wrong target. In timed and rapid fire the soldier at fault is credited with only such hits (if any) as he may have made on his own target; the other soldier repeats his score.

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294. TWO SHOTS ON SAME TARGET.—In slow fire, if two shots strike a target at the same time or nearly the same time, both will be signaled; and if a shot was just fired from the firing point assigned to that target, the hit having the higher of the two values signaled will be entered in the soldier's score and no record made of the other hit.

295. STATIONS OF SCOREKEEPERS.—The scorekeepers in slow and rapid fire will be seated close to and in rear of the firing-point stakes, and will record the scores and announce the results as required in paragraphs 101 and 102.

296. CHANGING A SCORE.—Competitors must pay attention to the score as announced and recorded, so that any error may be promptly investigated. The recorded value of any shot will not be changed after the following shot has been fired, unless some special message with reference to it is received from one of the range officers in the target pit. Any alteration of a score must be witnessed by the officer in charge of the firing point and indorsed with his initials.

297. NUMBERING COMPETITORS.—At all competitions where a number of men engage in the same matches or competitive firing the labor of the statistical officers will be greatly lightened and the prompt announcement of the score facilitated by giving to each competitor a number by which he is known throughout the firing.

298. SCORE CARDS.—Each competitor should be given a score card stating his target and order of firing, and containing a blank space for the record of shots fired and for the signature of the scorer. These score cards should be printed on cardboard, using different colors for different ranges; but for all kinds of firing employing the same color for the same distance, as, for instance, all score cards for 200 yards, yellow; for 300 yards, red; for 500 yards, blue; for 600 yards, white, etc. This rule will prevent such a mistake as a competitor firing on a 300-yard score card, with its particular assignment of target, at 200 yards, as the score keepers quickly become familiar with the color corresponding to each distance.

As scores are completed an officer or noncommissioned officer detailed for that purpose should, without waiting for all the firing to cease, collect the records of the scores and transmit them to the statistical officer, who will enter them in the

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permanent record and their totals upon the bulletin sheets prepared for that purpose.

ARMS AND AMMUNITION.

299. ARM TO BE USED.—In the authorized competitions officers and men will use the rifle or revolver as issued by the Ordnance Department for habitual use in the service.

300. ALTERING THE SIGHT.—Except that the sights may be blackened, no alteration of the regular service sights will be permitted. The use of auxiliary appliances is prohibited.

301. TRIGGER PULL.—The trigger pull must always be at least 3 pounds for the rifle and 4 pounds for the revolver, and will be tested (holding the barrel vertically) by a range officer, before firing each day and at each range. Competitors will submit their arms for further inspection whenever required.

302. AMMUNITION.—Unless the use of other ammunition is distinctly authorized, the ammunition used will be the service cartridge for the arm as issued by the Ordnance Department.

SHOOTING.

303. GENERAL REGULATIONS.—The rules governing every feature connected with range practice as prescribed in this manual will, so far as applicable, regulate the procedure in competitions.

304. UNIFORM.—Competitors will wear the service uniform and cartridge belt, with cartridge-belt suspenders.

305. SHELTERS FOR FIRER.—Sheds or shelters for the firer will not be permitted at any range.

306. PUNCTUALITY.—Competitors must be present at the firing points punctually at the proper time and in the order stated on their score cards. No application on the part of the competitor for any alteration in his assignment will be entertained.

307. ORDER OF FIRING.—In slow fire the competitors will place themselves at the firing points by twos, and will fire alternately, the odd number of each pair being on the right and firing first.

308. LOADING PIECES.—Pieces will not be loaded except by command or until position for firing has been taken. In load-

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ing the revolver only five cartridges will be inserted in the cylinder at one time.

309. POSITION IN REVOLVER COMPETITIONS.—At the firing stand, when not firing, the revolver will be held at raise pistol. While firing, the revolver will be held and supported by one hand only, the arm extended at will, but free from the body and unsupported in any way.

310. WITHDRAWING TARGET PREMATURELY.—In slow fire if, just as a shot is fired, the target is withdrawn from the firing position, the scorer at that firing point will at once report the fact to one of the range officers who, if upon investigation, is satisfied that the case is as represented, will direct that the shot be not considered and that the soldier fire another shot.

311. DELAY OF SCORE.—In slow fire competitors will not be hurried in their firing, but such slight delay permitted after each shot as they may desire, provided the time of firing the score does not exceed an average of one minute per shot (thirty seconds in revolver firing). If an accident to a target, or any other cause over which the soldier has no control, prevents him completing his score within a reasonable interval, he will be permitted such additional time as a range officer may decide.

312. SKIRMISH FIRE.—In skirmish fire 30 cartridges will be issued before each run to each competitor, and he will not be permitted to have any other cartridges about his person. If any cartridge fails to explode, it will not be replaced. If a gun becomes disabled, the incomplete score will not be considered, but the competitor will repeat the run. If the target of any competitor is withdrawn because of having more than 5 hits at any one halt, the entire run for that competitor will be repeated.

313. CHANGING ARMS.—No two competitors shall shoot in any competition with the same rifle, nor shall a competitor change his rifle during any competition, unless his first rifle has become unserviceable through accident, which must be verified by a range officer. The same rule applies to the revolver. Willful and intentional violation of this regulation will warrant the officer in charge, in his discretion, excluding the competitor from further competition.

314. CLEANING PIECES.—Pieces may be cleaned only upon the completion of a score. In competitions at more than one distance cleaning will be permitted between distances. While

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with these restrictions cleaning will be permitted, it will not be required.

315. COACHING.—No "coaching" or unnecessary communication of any kind with those actually firing will be permitted.

316. WARMING SHOTS.—No warming or fouling shots will be allowed in any competition.

317. ORDER OF FIRE.—The order of fire will be determined by the officer in charge of the competition.

318. SPECTATORS.—During the progress of a match or competition, no one except the officers on duty at the range, the competitors, and scorekeepers will be permitted within the ropes without special permission of the officer in charge.

319. STATIONS OF COMPETITORS AWAITING TURN TO FIRE.—The squads of competitors will be stationed 10 yards in rear of the firing point, where each competitor must remain until called by the scorekeeper to take his position at the firing point and until he has completed his score.

320. EXPRESSIONS OF APPROBATION, ETC.—Expressions on the part of the competitors of approbation or disappointment, with reference to any scores made by themselves or others, must not be uttered loud enough to be heard at the firing point.

321. PROTESTS.—Protest and objections must not be directly submitted to the officer in charge, but to one of the range officers. In case a competitor considers the decision of the latter unwarranted by the facts as presented, he may appeal to the officer in charge. Final appeals from decisions of the officer in charge must be made in writing and forwarded through that officer to the authority ordering the competition.

322. SPECIAL RULES.—Such special rules or directions as the officer in charge may give must be rigidly complied with by competitors and all other persons upon the range grounds.

TIES IN RIFLE COMPETITIONS.

323. IN SLOW AND RAPID FIRE.—In slow and rapid fire ties will be decided as follows:

(1) By the highest aggregate score made in rapid fire; if still a tie, by the highest total score in rapid fire at 500 yards. If still a tie, the decision will be regulated by the highest total score in rapid fire at 300 yards. If still a tie, the decision will

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be regulated by the highest total score in succession made at 600, 500, 300, and 200 yards, slow fire.

(2) By the fewest misses in rapid fire.

(3) By the greatest number of hits on figure in rapid fire.

(4) By the fewest misses in slow fire.

(5) By the fewest outers in slow fire.

(6) By the fewest inners in slow fire.

(7) If still a tie, by firing single shots at the longest range.

IN SKIRMISH FIRE.—In skirmish fire ties will be decided as follows:

(1) By the greatest number of penalties imposed.

(2) By the greatest number of hits in figure and four space.

(3) By the fewest hits in the four space.

(4) If still a tie, a special run in skirmish fire.

IN AGGREGATE SCORES.—Ties in aggregate scores will be decided by giving precedence to the competitor having the best total score in the skirmish fire. If the scores in the skirmish fire are also of the same total, the order of merit for that fire (and, therefore, the final order of merit) will be determined as in skirmish fire above.

TIES IN REVOLVER COMPETITION.

324. IN THE AGGREGATE SCORES.—Upon the completion of a revolver competition, ties found in the aggregate scores of two or more competitors will be decided as follows:

(1) By the highest aggregate score made in rapid fire; if still a tie, by the highest total score made at 25 yards, rapid fire. The tie continuing, it will then be regulated in succession by the fewest misses and by the greatest number of hits in the bull's-eye, the nine space, the eight space, and so on in succession, in rapid fire.

(2) If necessary, the comparison will then extend to timed fire, and will be decided in the following order: (*a*) By the greatest number of penalties imposed; (*b*) by the highest total aggregate score; (*c*) by the highest total made at 50 yards; (*d*) by the fewest misses at both ranges together; (*e*) by the fewest hits in the two space, the three space, the four space, and so on in succession, at both ranges.

(3) The tie still continuing, the comparison will then extend to slow fire, and will be decided in the following order: (*a*) By

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the highest total score made at 75 yards; (*b*) by the fewest misses at both ranges together; (*c*) by the fewest hits in the two space, three space, the four space, and so on in succession at both ranges.

(4) If there be still a tie, it will be decided by firing single shots, at 75 yards, slow fire.

PENALTIES.

325. EVADING RULES.—Any competitor who shall be detected in an evasion of the conditions prescribed for any competition shall be excluded from further participation in the firing.

326. FIRING TWICE.—Any competitor who shall fire in a name other than his own, or who shall fire twice for the same prize, unless permitted by the conditions of the competition to do so; or

327. FALSIFYING SCORES.—Any competitor who shall be guilty of falsifying his score, or being accessory thereto; or

328. OFFERING BRIBE.—Any competitor who shall offer a bribe of any kind to a scorer or marker shall, upon the occurrence being proved to the satisfaction of the range officers and the officer in charge, be reported in writing to the officer ordering the competition, who will then direct that the competitor be forever disqualified from taking part in future contests.

329. INTOXICATION, ETC.—Any competitor refusing to obey the instructions of the officer in charge, or his assistants, or violating any of these regulations, or being guilty of unruly or disorderly conduct, or being intoxicated, will be immediately debarred from further competition at the meeting. The officer in charge will also report the facts in the case to the officer ordering the competition, who will take such further action as he deems proper.

330. INTERFERENCE.—Any person, whether a competitor or not, interfering with any of the firing squads, or annoying them in any way, will be warned to desist, and if the offense be repeated he will be at once ordered off the range grounds.

331. ACQUAINTANCE WITH REGULATIONS.—Competitors and all others connected with the meetings of military riflemen must make themselves acquainted with the foregoing regula-

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tions, as well as with the conditions of competitive firing in which they may be participating, as the plea of ignorance of either of them will not be entertained.

DISTINGUISHED CLASSES OF MARKSMEN.

332. REQUIREMENTS.—Whenever a marksman has won three authorized medals in department, departmental, division, and army rifle or carbine competitions, or in department, departmental, division, and army revolver competitions, or as a member actually firing on a prize-winning team in the national team match, he will be announced in orders from the War Department as belonging to a distinguished class, no longer eligible to enter the departmental competitions with the arm in the use of which he is distinguished.

333. DESIGNATIONS.—If the three medals were won in rifle or carbine competitions, the marksman will be designated a "distinguished marksman," and if in a revolver competition, a "distinguished revolver shot."

334. BADGES.—To distinguished marksmen and to distinguished revolver shots, appropriate badges will be issued which, after being received by the soldier, if lost, can be replaced by purchase only, for which authority must be obtained from the War Department.

COMPETITIONS IN THE PHILIPPINE ISLANDS.

335. Competitions in the Philippine Islands will take place in such numbers, under such regulations, at such places, and at such times as the division commander may direct.

POST COMPETITIONS.

336. OBJECT.—To further the interest in target practice, post contests in small-arms practice are suggested. When practicable post competitions should form a part of the exercises for periodical field days. The programme for these competitions is left to the discretion of the post commander. The firing should, as a rule, be team firing. The rules governing the departmental competitions will, so far as applicable, regulate the procedure in post competitions.

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CHAPTER III.

INSTRUCTIONS AND SUGGESTIONS.

337. STATIONERY, ETC.—As soon as the officer in charge is detailed stationery and office furniture should be obtained from the proper authority. The articles of stationery will ordinarily be obtained from department headquarters on requisition; the office and desk furniture, such as chairs, desks, typewriting machine, mimeograph or hectograph, rulers, steel erasers, etc., will ordinarily be obtained from the post quartermaster on memorandum receipt.

338. STAFF OFFICERS.—Four staff officers are usually sufficient; one chief range officer, one adjutant and statistical officer, one quartermaster, ordnance officer and telephone officer, and, if the competitors encamp, one commissary. A medical officer and hospital corps detachment are also necessary if the encampment is distant from a post.

339. CHIEF RANGE OFFICER.—The chief range officer has charge of the range and pit and all details pertaining thereto. During the firing his place is on the firing line. During skirmish fire he personally commands the firing line.

340. RANGE OFFICERS.—Under the direction of, and as assistants to the chief range officer, are a number of range officers, not fewer than one to two targets in the pit, and one to two firing points on the range, or to two skirmishers in skirmish fire.

341. ADJUTANT AND STATISTICAL OFFICER.—To the adjutant may properly be assigned the direct charge of the competitors, whether they are encamped or assigned to companies in barracks.

The work of the statistical officer is most exacting. It is understood that, from the nature and importance of his duties, he must be absolutely accurate in his work. As a check, it is well to have two independent calculations of all scores, one by the officer and one by the clerk.

342. QUARTERMASTER, ETC.—This officer has charge of the supply of ammunition, sandglasses or timers, benches, tables, tents for shelter, boundary rope, trigger weights, and office furniture, and the preparation and care of the range house and range.

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343. DETAILS OF ENLISTED MEN.—The details of enlisted men for their several duties should be permanent for the competition. In skirmish firing, a noncommissioned officer should follow each competitor and should be instructed to kneel and sight over the shoulder of the firer to see that he fires on the proper target. These noncommissioned officers should be changed from one competitor to another for each run.

344. ASSIGNMENT OF TARGETS.—Instead of assigning competitors to targets by lot, it is believed fairer to assign them by a scheme worked out prior to the competition; this scheme so planned as to minimize the chances of collusion.

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PART VIII.

MISCELLANEOUS.

CHAPTER I.

CLASSIFICATION AND EXTRA COMPENSATION.

345. CONDITIONS AND REQUIREMENTS.—The conditions and requirements for qualification in the several grades of marksmanship are as follows:

For marksman an average of 80 points is required in five consecutive estimates of distances and a total of 300 in the record firing, marksman's course;

For sharpshooter an average of 85 points is required in five consecutive estimates of distances, a total of 90 points in the record practice, sharpshooter's course, and an aggregate in the record practice, marksman's and sharpshooter's course of 415 points;

For expert rifleman an average of 90 points in five consecutive estimates of distances and a total of 25 points in the prescribed expert rifleman's test. All who in firing make the total required for marksmen, will take the sharpshooter's course; all who make the aggregate required for sharpshooter will take the expert rifleman's test.

In estimating distance failure to qualify in a grade equal to, or higher than, that obtained in rifle firing, reduces the final qualification of the soldier to one grade below that obtained in firing.

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All who fail to qualify as marksman or better will be classified as "unqualified."

The soldier having attained the grade of marksman or better will retain that classification during his current enlistment unless in subsequent firing he attains a higher grade. (See paragraph 87.) The officer who attains the grade of expert rifleman will retain that classification. The officer who attains the grade of marksman or sharpshooter will retain that classification so long as he completes the course required or until he attains a higher grade. Failure of an officer to complete the course required, will, unless he is an expert rifleman, operate to reduce his classification one grade.

Table of classification.

Grade.	Estimating distance.	Rifle firing.						
		Marksman's course.		Sharpshooter's course.			Expert rifleman's test.	
	Average number of points required in 5 consecutive estimates of distance.	Points.	Per cent of possible.	Points.	Per cent of possible.	Aggregate points in marksman's and sharpshooter's courses.	Points.	Per cent of possible.
Unqualified[a]	.....	.....	.....	.....	.....	.....	.....	.....
Marksman	80	300	60	.....	.....	.....	.....	.....
Sharpshooter	85	.....	.....	90	60	415	.....	.....
Expert rifleman	90	.....	.....	.....	.....	.....	25	50

[a] All who fail to qualify as marksman or better.

346. WHO WILL BE CLASSIFIED.—All who are required or authorized to fire and who are borne on the rolls of the organi-

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zation during any part of the practice season or who are attached for practice by proper authority, will be classified.

Bandsmen, who fire in the Philippines, will not be classified. For coast artillery, see special course A.

347. SPECIAL CLASSIFICATION.—A special classification of "marksmen" will be made for all who properly follow and qualify in special course A. The requirements for qualification in this grade will be a total of 225 points for record practice in the entire course. This qualification will not entitle the soldier to increased pay.

CLASSIFICATION, REVOLVER.

348. WHO WILL BE CLASSIFIED.—All who qualify will be classified as expert revolver shots. All others borne on the rolls of the organization, and who are required to fire, will be classified as unqualified.

349. THE REQUIREMENTS FOR QUALIFICATION AS EXPERT REVOLVER SHOT.—All who are required or authorized to fire the dismounted course, and who in the record practice make a total of 320 points, and all who are required or authorized to fire the dismounted and mounted course, and who, in the two courses combined, make a total of 368 points, will be qualified as expert revolver shots.

Qualification, if not renewed, will cease one year from date of qualification.

350. EXTRA COMPENSATION.—In each enlistment a soldier will begin his firing with the marksman's course, and will receive such extra compensation therefor as may be authorized by law and regulations. The soldier who has completed the course of known distance practice and is transferred thereafter will not be given a second opportunity in the same target year to qualify unless he shall have been discharged and reenlisted; in case of transfer the soldier's classification, with the total of scores made, will be entered on the soldier's descriptive list. In case the soldier has not, at the time of transfer, completed his known distance practice for that year, his company commander will certify on his descriptive list the practice had in that season and the scores made, and his prior classification, if

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any, with total of scores, and the soldier will complete his known distance firing with the organization to which transferred, unless, in that organization, known distance practice for that year has been completed and the target season ended.

In the Philippine Islands, while rifle firing may be varied as the division commander may direct, so much of this manual as relates to necessary courses for qualification and classification for increased pay, provided by law, will be complied with.

CHAPTER II.

PROFICIENCY TEST.

351. PURPOSE.—In order that the proficiency in rifle firing of organizations which are required to follow the prescribed known distance course may be determined, they will be tested annually in one or more of the classes of fire in which instruction is required. While the test may not be the same for every organization, the percentage required for proficiency in any test will be such that the theoretical and practical knowledge of firing required to attain it will be no greater than that required for proficiency in any other test prescribed for that season.

352. HOW PRESCRIBED.—Three courses in firing, which shall prescribe an expenditure of not to exceed thirty rounds per man, will be prepared annually (at the School of Musketry) and will be sufficiently diversified to meet range conditions at the average post. The regulations in addition to those prescribed for range practice which are made necessary by the terms of the course, will be prepared and submitted with each course. The courses may include any class of firing required in known distance practice or field practice. The courses and regulations therefor will be forwarded to the Adjutant-General of the Army in time to reach him before January 1 of each year. When approved, a sufficient number of copies of each will be furnished to department commanders for distribution to the commanding officers of all posts garrisoned by organizations required to take the proficiency tests in order that the tests may be fired at the proper time. These courses will be considered as confidential, and no information regarding them will

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be given out until the time arrives for the test of each organization. The commanding general, Philippines Division, will prescribe the proficiency test for troops in that division.

353. STANDARD OF PROFICIENCY.—The method of finding and arriving at the standard of proficiency will be determined at the same time and in the same manner as the courses and regulations for the tests, and will depend on the character of the course, except that the number of soldiers participating in the test compared to the number on the rolls will always be one of the important factors in determining the result.

354. WHO WILL FIRE.—All enlisted men borne on the rolls of an organization at the time of taking the test, and no others, will fire throughout the test unless excused by the department commander; but no one will be excused until the company commander shall have shown in each case that it will be impracticable for the soldier to be present through no fault of his own. A soldier absent through his own fault, or who is not excused by the proper authority, will be considered as present and firing throughout the test. If there is not sufficient time to obtain the department commander's authority to excuse a soldier, the post commander is authorized to do so provided so much of the first sentence of this paragraph as refers to the company commander is complied with.

Soldiers who have never been classified and who join within twenty days preceding the test need not fire.

A soldier will be allowed to fire in a test with but one organization, in each target year, unless he reenlists in a different organization.

355. PROCEDURE.—The test will be fired under the direction and personal supervision of the post commander or an experienced officer of suitable rank specially selected by the post commander, and for any organization will consist of the firing required in one of the courses prescribed as in paragraph 352. The regulations governing known distance and field practice and the special regulations made a part of the course will govern. The test will be conducted with all the particularity of competitions and no information in regard to the course which any organization will be required to fire will be given out before the date set for the test. The test will be fired as soon as practicable after the completion of the regular season's firing and will, when possible, be conducted on the range on which the

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organization had the season's practice. The post commander, or the officer selected by him, having conducted the test, will grade the organizations as "proficient" or "deficient," according to the standard of proficiency prescribed. If proficient, he will further determine whether the results of firing were "good," "very good," or "excellent." In arriving at this decision he will give due consideration to the character of the range, the state of the weather when the test was conducted, and the facilities for rifle practice which have been accorded the organization.

356. PUBLISHING RESULTS.—The standing obtained by the organizations required to fire in the proficiency test will be forwarded to department headquarters. The standing will be reported on the annual report of small-arms firing for each department and will be published annually in orders from the War Department. Each organization will be classed as deficient or proficient, and, if the latter, it will be stated whether the fire efficiency of the organization is rated as "good," "very good," or "excellent."

CHAPTER III.

INSIGNIA AND TELESCOPIC SIGHTS.

INSIGNIA.

357. CLASSES.—Upon receipt at department headquarters of the report of known distance firing and classification and the report of revolver firing and classification, certain insignia, indicating their skill in marksmanship, will be issued to each expert rifleman, sharpshooter, marksman, and expert revolver shot; provided, however, that an insignia of any class having been issued to an officer or soldier, no other insignia of that class will be issued for a subsequent qualification except as provided in paragraph 361.

358. MARKSMAN'S PIN: SPECIAL COURSE A.—To marksmen, when first qualifying as such in special course A, will be issued a marksman's pin. If qualification is renewed in the succeeding season, the pin may be worn another year, and so on for further

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seasons, but if the grade of marksman is not reached, the pin will not be worn.

This pin will be issued upon the certificate of the company commander that the soldier has qualified under the regulations as a marksman in special course A.

359. RIFLEMAN'S INSIGNIA; MARKSMAN'S PIN.—To marksman, when first qualifying as such, will be issued a marksman's pin, which will be worn as long as he continues to draw the increased pay for that qualification.

SHARPSHOOTER'S BADGE.—To the sharpshooter a silver badge will be issued. For the first qualification in this grade the badge will consist of a pin and cross; the soldier having once qualified as a sharpshooter may continue to wear the badge as long as he continues to draw the increased pay for that qualification. For each requalification as sharpshooter a silver bar will be issued, which will specify the year of requalification and will be attached to the badge between the pin and the cross.

EXPERT RIFLEMAN'S BADGE.—To the expert rifleman will be issued a silver badge. The soldier having qualified as an expert rifleman may continue to wear the badge as long as he continues to draw the increased pay for that qualification.

For each requalification as expert rifleman, a silver bar will be issued, which will specify the year of requalification, and will be attached to the badge immediately below the pin.

360. EXPERT REVOLVER SHOT'S BADGE.—To the expert revolver shot a silver badge will be issued, which may be worn for one year from the date of qualification and thereafter for one year from the date of each subsequent qualification.

361. DUPLICATES.—These insignia will become the property of the persons to whom issued. If they are lost by the owner or in transmission to him, or if they become unsightly from long wear, they may be replaced without cost to the owner. But in all cases the official certificate of the company commander to the effect that he has investigated the circumstances of the loss or damage and finds that no negligence can be imputed to the soldier will be required as evidence upon which to make the new issues. Duplicates, if desired for use on separate coats, will be sold to those entitled to wear the insignia.

362. TELESCOPIC SIGHT.—To encourage efforts, to award efficiency, and to properly equip a special class of shots, who shall

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be not only designated as expert riflemen, but who, in action, shall be employed as such, the telescopic sight is adopted. These sights will be supplied by the Ordnance Department and assigned to enlisted men who have qualified under these regulations as expert riflemen. They will be issued to, and accounted for, by the company commander, and in his discretion may be carried by the men at inspections under arms.

CHAPTER IV.

RECORDS AND REPORTS.

363. RECORDS.—The company target record is the official record of the individual and company record practice. All records therein will be made in ink or with indelible pencil. It consists partly of a series of sheets, one for each soldier, ruled for the entry of his record practice and qualifications for each season of his three years' enlistment, and for a record of the medals won or standing attained in authorized competitions. When the soldier is transferred to another organization or detached for an extended period, his individual sheet will be completed to date, signed, and attached to the descriptive list which accompanies him. Another part of the company target record is given to a record of the company field practice. These sheets forming the company record will be bound by the loose leaf system, so that at any time one or more sheets may be extracted and others inserted. By this means the book will be at all times a live record.

During the regular practice season, and until paragraph 364 has been complied with, the company target record will be kept in the personal possession of the company commander.

For companies of the coast artillery, the record will contain sheets for individual record firing in special course A only.

364. REPORTS.—All reports of rifle and revolver firing will be submitted to the proper headquarters as soon as practicable after the completion of firing.

The reports required to be rendered are as follows:

1. Report of known distance firing and classification (annual, company, excepting companies of the coast artillery).

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2. Report of rifle firing under special course A (annual for companies of coast artillery).
3. Report of field practice (annual, company).
4. Report of revolver firing and classification (annual, company, for all armed with revolver).
5. Report of small-arms firing (annual departments and division).

These reports will be rendered on prescribed forms furnished by the Adjutant-General of the Army.

Commissioned officers will be reported on the annual company, department, and division reports.

Organizations of field artillery, coast artillery, and infantry will render the reports of revolver firing and classification so far as such firing is required.

All reports of territorial departments in the Philippine Islands will be made to the commanding general of the Philippines Division.

An annual report of small-arms firing by the organized militia of each State will be rendered as soon as practicable after the close of firing on prescribed forms to the Chief of the Division of Militia Affairs.

CHAPTER V.

INSPECTORS OF SMALL-ARMS PRACTICE.

365. How SELECTED.—An inspector of small-arms practice, who shall be an officer of suitable rank and experience, will be detailed at the headquarters of each department and the Philippines Division from the officers on duty thereat. These officers will be selected with reference to their peculiar fitness and qualifications in this line of professional work.

366. DUTIES.—It will be the duty of the inspector of small-arms practice to exercise supervision over the small-arms practice within the department, to examine the regular reports of firings, and to keep the division or department commander informed as to the degree of proficiency manifested by the troops of the various units of his command.

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